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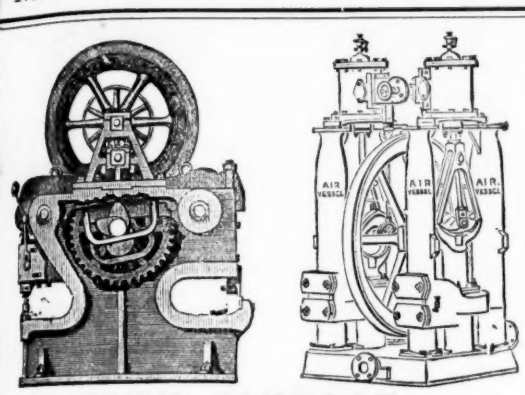

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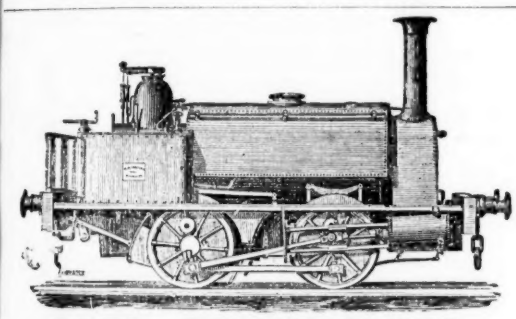

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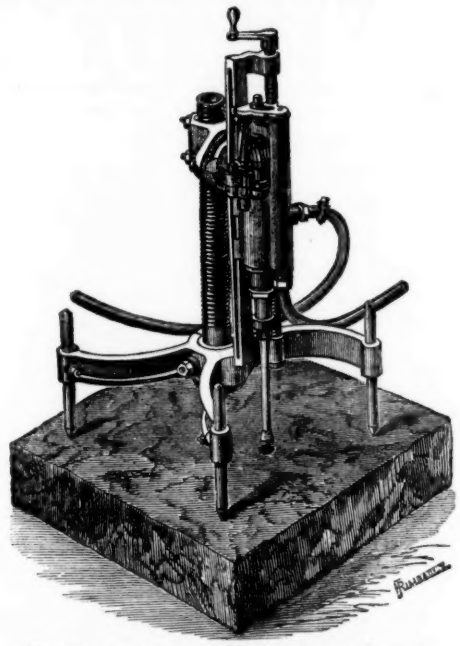

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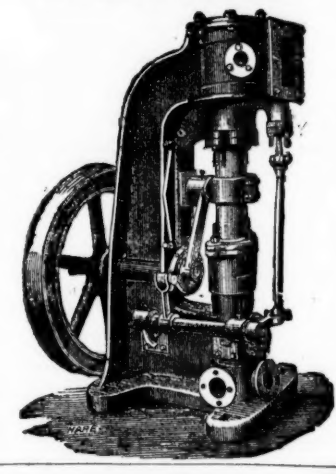

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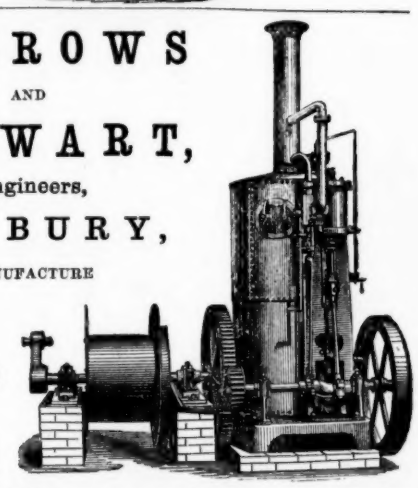

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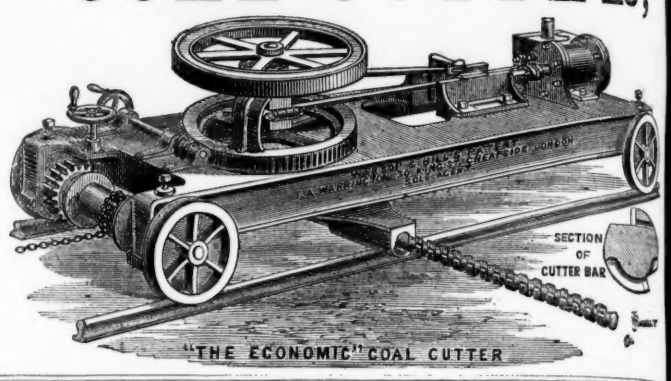

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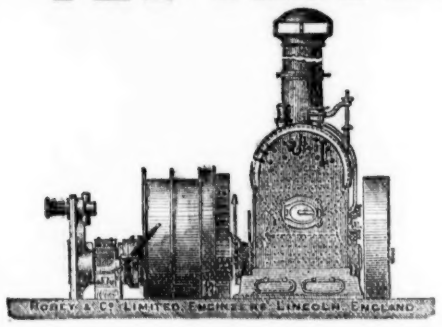

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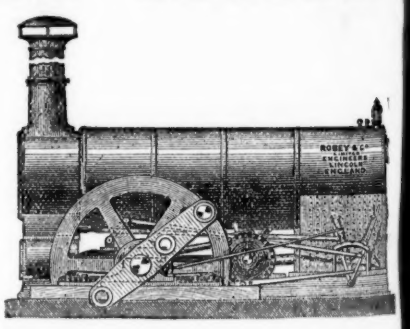

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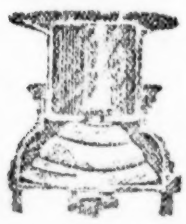

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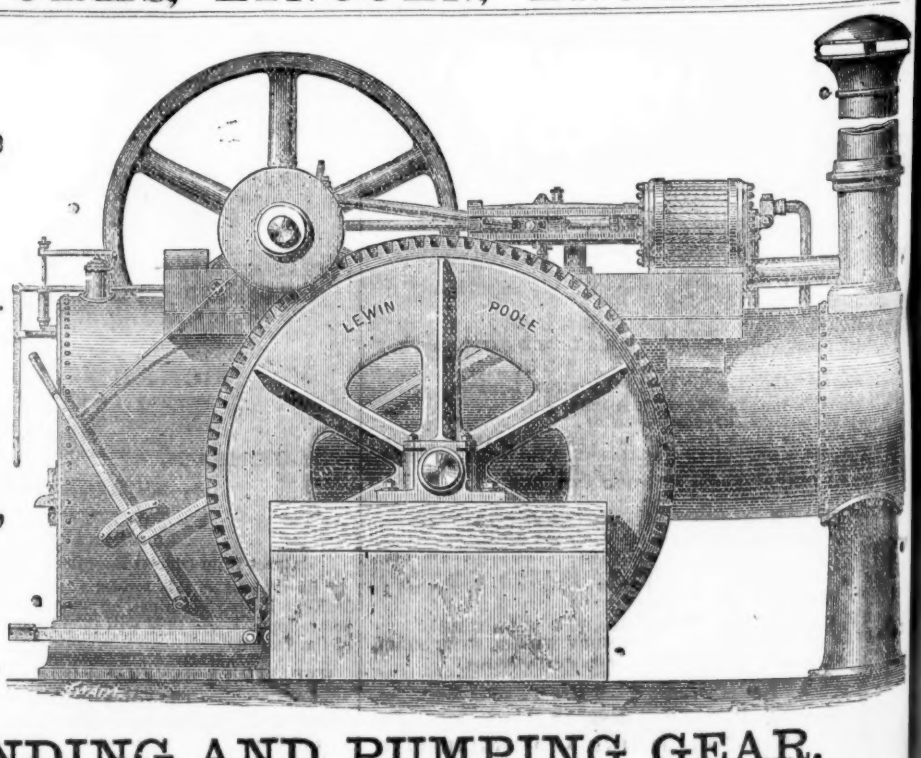

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MEETING OF THE IRON AND STEEL INSTITUTE.

The Iron and Steel Institute of Great Britain has arranged to hold its next annual provincial meeting at Barrow-in-Furness, and the Council have nearly completed all the necessary arrangements. The programme of papers to be read, so far as it has yet been prepared, is a short one, but it covers a wide area of scientific research, and should prove extremely interesting. It is probable, moreover, that other papers will come to hand before the meeting has fairly begun. This, at any rate, was the case at Liége last year, for nearly one-half the communications made do not appear on the official programme at all. However, on the Barrow programme, now lying before us, there are twelve papers, only two of which specially relate to the district in which the meeting is to be held. These papers are—"On the Rampside Boring, near Barrow," by Mr. Alexander Brogden, M.P.; and "The Geology of the West Coast Iron Districts," by Mr. P. Wurzburger, Dalton-in-Furness. Two other papers may be said to have special application to the Barrow district, inasmuch as they deal (1) with improvements in setting Bessemer converters; and (2) with the latest improvements in appliances for the manufacture of Bessemer steel. There are two American papers down for hearing, the first being on Blair's new direct ironmaking process (by the patentee), and the next on rolling mill machinery arrangements in America. Other two may be said to belong to the Cleveland district—the paper "On Ironstone Mining in Cleveland," by Mr. A. L. Steavenson; and that "On a New Form of Blast-Furnace Hoist," by Mr. T. Wrightson. Other papers are announced—"On the Iron Ores of Sweden," "On the Howard Safety Boiler," "On Valves suitable for Working Hydraulic Machinery," and "On Mechanical Puddling," by Mr. Thomas R. Crampton, of London.

It is more than likely that on this as on other occasions "the last shall be first"—that the subject of mechanical puddling will evoke more discussion and provoke more interest than any other paper on the programme. Since the London meeting of the Institute, in May last, mechanical puddling has gone through many new phases; but not the least important has been the substitution at the Carlton Works of the North of England Industrial Iron and Coal Company of the Crampton furnace for that of Danks. The directors of the North of England Industrial Iron and Coal Company reported that the Danks process of mechanical puddling was a "signal failure," and it has been acknowledged by several gentlemen who had good opportunities of judging that there are mechanical difficulties of the most serious character to be overcome before the Danks process can be made so perfect as to justify its general adoption. The expansion and contraction of the furnace produced by the intense heat, and the destruction of the interior lining, make the cost of wear and tear excessive, and there are no authentic figures yet before us to show that there is any economy of fuel achieved by the adoption of the process. At the same time, it is an admitted fact that the iron made by the Danks process is much better than that obtained by hand puddling, and will fetch a higher price in the market. Of Mr. Crampton's system of mechanical puddling the least apparently that can be said is this, that he has succeeded where Mr. Danks has failed. He has certainly brought about a great economy of fuel, for not more than 14 cwts. of coal to the ton of puddled bar are used in his process, as compared with 25 cwts. of coal per ton of puddled bar by the ordinary process. Mr. Crampton also uses coal-dust in his furnace, which is less expensive than the ordinary fuel. But the great merit of the Crampton system in comparison with that of Danks consists in the fact that in the former the difficulties of expansion and contraction are entirely overcome. The revolving diameter of his furnace is covered with water, and the result is, as the patentee has himself put it, "that with 20 revolutions a minute in a machine weighing 15 tons you can stand at the back of it and cannot hear it work, because the arrangements are so contrived that water can be injected throughout the whole surface of the revolving diameter." In the course of some experiments made with a furnace 12 ft. long, and 6 ft. in diameter, Mr. Crampton was able to puddle pig-iron in an hour and a quarter from the time it was cold, and practical men accustomed to the use of the ordinary reverberatory furnace may hardly credit the fact that not only has this been done without injury to the furnace, but cold air has actually been blown into the furnace to cool it as fast as possible. By applying the water casing round the brickwork of his furnace, M. Crampton found that, although it was hot enough to melt anything, the bricks on the bridge were only worn off half-an-inch in 100 hours. By all who have seen Mr. Crampton's furnace at work at the Royal Gun Factory at Woolwich it is admitted to be a complete success, and between his admirers and the friends of Mr. Danks there is scope for an active and interesting comparison of notes.

The paper promised by Mr. David Joy, "On the Howard Safety Boiler," is one that should go a step further in the direction of settling the vexed question of the safest and most economical boiler now in use. According to the recent report of the Boiler Explosions Committee, it appears that the average number of boiler explosions per annum in this country is 50, and that the average number of lives lost per annum from these explosions is 75, in addition to which a large number of persons annually sustain serious injuries. There are in the United Kingdom not less than 100,000 steam-boilers (exclusive of boilers in locomotive engines, steam-ships, and domestic and hot-house boilers), so that the annual rate of explosion is 1 in every 2000. The Howard boiler has now been at work for a considerable time, and it is beyond all question that, although there may be a little more care required to keep the water at a proper height than in the ordinary Lancashire boiler, the Howard is the more safe boiler of the two. The peculiarity of the Howard lies in the great number of tubes which contain the water. While these tubes make inspection the more difficult—for it is impossible to go inside the boiler—they diminish the risk of danger, seeing that an explosion, should such a thing occur, is confined to a particular tube, which may and sometimes has given way, without even scalding the men that are close by. At the extensive works of John Crossley and Sons, Halifax, where there are a good many Howard boilers at work, there have at one time and another been not less than 12 explosions, but not one of them was attended with any injury to life or property. The difficulty of inspecting the Howard boiler has in some cases been got over by using a long gas-pipe, with jets of gas, in such a way as to see from one end of the boiler to the other. The Howard boiler is more economical than the ordinary Lancashire or Cornish boiler in respect of fuel—not so much in what the boiler evaporates as with regard to the working of the engine, and making the engine suitable for the pressure. The pressure varies from 40 up to 150 lbs. The Howard boiler is chiefly valuable for buildings, such as cotton, woollen, carpet, or jute factories, because in the event of its exploding the risk of injuring the building underneath or adjoining which it might be placed would be limited in comparison with the risk attending the use of an ordinary boiler in the same way. But it is not only in cases of this kind where the Howard boiler is applied. It has recently superseded the Cornish boiler at some of the ironstone mines in Cleveland, and it seems for general purposes to be more in favour than any other.

The reader of the paper "On Ironstone Mining in the Cleveland District" is Mr. A. L. Steavenson, chief viewer for the extensive ironstone mines and collieries of Messrs. Bell Brothers, of the Port Clarence and Washington Works, in the Middlesborough district. Mr. Steavenson is a thorough master of the subject of ironstone mining, and one of the most eminent authorities in the North on the manufacture of coke. He has read several interesting papers before the North of England Institute of Mining and Mechanical Engineers on the manufacture of coke in connection with the Northern coal field, and cognate topics. Of the subject on which he proposes to discourse at Barrow he can say little that has not been said before at one time or another in, perhaps, a different form, for the geological and mineralogical features of Cleveland have been held up to public exhibition almost *ad nauseum* since the time that Bewick read his exhaustive paper before the mining engineers at Newcastle. But yet in such a remarkably progressive district as that of Cleveland the science of mining is continually undergoing new phases, and prospectors are always meeting with fresh experiences worthy of being recorded and preserved. Within the last two years a great development of the mineralogy of Cleveland has taken place, and some very expensive sinkings have been carried out. It is commonly supposed that ironstone mines cost much less to open out than coal pits. Let those who have held this belief be no longer deceived. At the present time there are two mines being opened out in Cleveland, each of which cost over 100,000*l.* before the ironstone was won. These are the mines being opened out at Kilton by the Kilton Ironstone Company, and the mines which Bolckow, Vaughan, and Company are opening out at North Skelton. From the former mines it is intended to raise 10,000 to 12,000 tons of ironstone per week. This mine has been over three years in sinking, and during that time the quantity of water pumped has reached the enormous total of 4,700,000 tons. The North Skelton Mines have also been over three years in sinking, and have been opened out at a tremendous cost. The arrangements now in progress for the development of the ironstone of Cleveland will, when completed, enable over 3,000,000 tons of ironstone per annum to be turned out over and above the present total of 7,000,000 tons a year. It is calculated, also, that close on 4,000,000 tons of this immense production will be raised from royalties belonging to Mr. Wharton, of Skelton Castle, who will within the next three or four years realise from royalty payments an income of not less than 100,000*l.* a year.

Mr. Thomas Wrightson, of the Teesdale Ironworks, South Stockton, is down for a paper "On a New Form of Blast-Furnace Hoist." The firm of which Mr. Wrightson is a managing partner have given a good deal of attention to hydraulic machinery, and their blast-furnace hoists have been favourably known in Cleveland for a considerable time. In the session of 1870 Mr. Wrightson read a most exhaustive paper on Blast-furnace Hoists before the Cleveland Institute ot Engineers. In that paper he divided blast-furnace hoists into two classes—(1) those hoists which accumulate power, and (2) those which require the full power of steam brought to bear at the time of lifting; or, in other words, accumulating and non-accumulating hoists. Among the non-accumulating hoists are—(1) the direct-acting steam ram-lift; (2) the ordinary winding-engine, with drum and wire rope, and reversing motion, applied both to the vertical and inclined lifts; and (3) the pneumatic lift, patented by Mr. Gjers, of the Ayresome Works, Middlesborough, in which the power is transmitted through the medium of air to the raising of the weight. Among accumulating hoists there are—(1) the water-balance hoist; (2) the Armstrong hoist; and (3) the hydro-pneumatic hoist, in which compressed air is the medium accumulated. The hydro-pneumatic hoist patented by Mr. Wrightson is very useful for low lifts, and has been successfully applied to high lifts, one of them having been recently applied to the large calcining kilns of the Liveston Iron Company, in Cleveland. By the principle adopted in this form of hoist the air admitted to the bell or balance-weight is exactly in proportion to the weight lifted, as at the moment the proper amount of water is displaced the bell rises, and the air supply valve is closed. No attendance is required for this hoist, as the chargers have only to lock the bell by means of a lever, which also works the necessary valves, and the cages cannot then move until the chargers have emptied the barrows, placed them on the cages, and unlocked the bell, which motion admits air into a lower bell, and the hoist performs its work without any further attendance or trouble.

The "Geology of the West Coast Iron Districts"—the paper promised by Mr. P. Wurzburger—will be amply illustrated in the course of excursions arranged for the members of the Institute. The hematite ore of Lower Furness is found in the strata and carboniferous or mountain limestone, being, as far as ascertained, about 7 miles long, by a greatest breadth of 4 miles. The general dip is towards the south-east. In the year 1857 there were 22 mines at work in this district, producing 464,853 tons of ore per annum. Now there are more than 33 mines at work, and the production of ore for last year was over 2,000,000 tons, or about one-third of the production of the Cleveland ironstone mines. The hematite is found in deposits, resembling a huge chemical precipitate, and consisting for the most part of minute particles, in which larger pieces are embedded. Prof. Sedgwick was of opinion that these deposits were of a chemical aqueous formation, but it is held by others that the hematite was injected into the pockets in which it is now found by direct volvanic or igneous agency. The deposits of hematite found throughout the Furness district have been divided into two classes—(1) deposits filling out irregular hollows; and (2) deposits of vein-like appearance, filling out fissures of varying width. The following tabulated statement exhibits in a compendious form the two classes of deposits as illustrated by the various mines now worked in the Furness district:—

Deposits in Hollows.	
Askam.	Lindale Moor (California).
Carr Kettle.	Monsell.
Cross Gates (Denny's).	Park House.
Dalton Mine.	Park.
Dalton Mine (Clegg's).	Poaka.
Eure Pits (Ulverston Mining Co.)	Roanehead.
Ellis-Cales.	Stonefolds.
Green Haume.	
Deposits in Fissures.	
Bolton Heads.	Plumpton.
Gilbrow (Lindale Moor).	Stainton.
Lindale Cote.	Stank.
Lindale Moor.	Tarn Close.
Longlands.	Thwaite Flat.
Newton.	Urswick.
Old Hills.	Whitriggs.
Pennington.	

The papers promised on Improvements in Bessemer Steel Machinery cannot fail to prove deeply interesting in a district which is fast taking its place in the front rank of steel-making centres. There is also something to be expected from the description to be given by Mr. A. L. Holley, of New York, a well-known engineer, on Rolling Mill Machinery Arrangements in America. It was through the medium of the Iron and Steel Institute two years ago that Lanth's three high rolls were first publicly introduced into this country. Since then this system of rolls has rapidly made its way. It may be seen in operation at several establishments in the Cleveland district, and at the Ougrée and other works in Belgium it has superseded the older system of rolling sheets and plates.

Of next week's meeting, as a whole, we cherish the hope that it will render good service to the cause of science, and sustain the already high reputation of the Iron and Steel Institute as the first society of its kind in the world.

NORTH STAFFORDSHIRE MINING INSTITUTE.

The members of this Institute, to the number of about 60, visited the Wigan coal and iron district on Monday, and inspected the Rosebridge Colliery, the Wigan Coal and Iron Company's works, and the Pemberton Colliery. Arriving at Wigan Station at 9·30, they were met by Mr. Wm. Bryham, who had provided refreshments for them, and conducted them to the Rosebridge Colliery, where Mr. John Bryham took in charge those who went down the pit. The shaft is the deepest in the world (815 yards), and is 16 ft. in diameter. There are four seams of coal being worked—Wigan, Five-feet, at 450 yards; Wigan Four-feet, at 470 yards; the Yard coal, at 680 yards; and the Arley, at 810 yards. The engine is by Daglish and Co., St. Helens; the cylinder is 36 in. in diameter; the drums, 22 and 26 ft.; stroke, 6 ft. The ventilation of the pit is by furnace, and is very good. The roadways are somewhat narrow and low, and great difficulty and cost are involved in keeping up the roof. Mr. John Bryham has introduced a self-acting disengaging hook, for preventing accidents in winding. It is impossible to wind the cage sufficiently high to cause an accident, and to prevent the cage from falling down the pit shaft catches are fixed in the guide rods, and are so arranged that the cage in ascending raises the catches, and immediately it has passed them they fall to their original position, and receive the cage when it is disconnected from the rope.

At the Wigan Coal and Iron Company's works, which were next visited, Mr. T. M. Percy, assistant manager of the furnaces, was in charge. There are ten furnaces, five of which are 80 ft. high and 24 ft. in the boshes, the other five being 65 ft. high and 19 ft. in the boshes. They are blown by three pairs of compound engines, with blowing cylinders 100 in. diameter; steam cylinders, 45 high pressure, and 66 low pressure, 12 ft. stroke. The heaters for heating the blasting-furnaces are all fed by the waste gases of the furnaces, as well as 18 double-flued boilers, which are used for producing steam for the blas-engines. The five smaller furnaces were erected about 20 years ago, the larger ones about 8 years ago. The smaller furnaces are capable of yielding 350 tons and the larger ones 400 tons of pig-iron in a week. Bessemer, hematite, foundry, and forge iron are made elsewhere from the pigs produced here.

After lunching at the Railway Inn, Wigan, the members next visited the Pemberton Colliery of Messrs. Blundell and Son. It is near Pemberton Station. The first sod was cut in December, 1862. Two shafts, one upcast and one downcast, have been sunk to a depth of 640 yards. The downcast is 17 ft. 4 in. diameter at the top and 18 ft. at the bottom. They were built in this way to admit of tubing to keep out the water, which was expected to be troublesome. The time occupied in sinking was two years and three months, and six months were occupied in driving shafts in the different seams. The shafts are lined throughout with massive fire-clay quarles, and the conductors are on a new principle. Down each side of the shaft run pairs of railway metals, weighing 42 lbs. per yard, which are stripped by shoes fixed on the cages very similar to ordinary chairs. One great advantage of this is that the centre of the pit is left quite clear, while at the same time the work of winding is carried on with perfect safety. The cages, each of which holds six tubs, are made entirely of steel, and weigh 28½ cwt. The tubs also are made of steel, weighing 2¾ cwt., and carry about 7½ cwt. of coal. The ropes are of steel, and taper from 1⅝ to 1¼ in., and weigh about 3 tons. The engine-houses contain two pairs of 36 in. cylinder horizontal winding-engines, 6-ft. stroke. The winding drums (Burrows' patent) are conical in form, with a maximum diameter of 30 ft. 6 in., and a minimum of 19 ft., arranged for winding from a depth of 624 yards in 21 revolutions. The pulleys are 18 feet diameter. There are 16 boilers. The heapstead is constructed entirely of steel. The pit is ventilated by fans; for driving these are two 36-in. cylinders, with a stroke of 3 ft. 6 in., calculated to produce, at 53 revolutions and 3⅝ in. water-guage, 225,000 cubic feet of air per minute, which, by increasing the speed to 60 revolutions per minute, would be increased to 270,000 cubic feet per minute. At the luncheon referred to above the President of the Institute (Mr. C. J. Homer) proposed the health of the coal and iron masters and managers of the coal and iron works in the Wigan district, testifying to the readiness with which they supplied information to persons at a distance. He spoke of the Pemberton Works being replete with everything requisite for carrying on colliery operations. Mr. W. Bryham, in responding, said it was owing to his misfortune in having the deepest pit in the world that his name was brought so prominently forward. He should be much happier if the Rosebridge pit was half the depth, and contained double as much coal as it did.

The toast of "Success to the North Staffordshire Mining Institute" was proposed by Mr. Bryham, and acknowledged by Mr. Homer, who expressed his belief that at no distant date shafts would be sunk 1000 yards, and even 1200 yards, deep.

ROYAL CORNWALL POLYTECHNIC SOCIETY.

The annual meeting and exhibition of the Royal Cornwall Polytechnic Society has been held this week, in the Polytechnic Hall, Falmouth, under the presidency of Mr. A. Pendarves Vivian, M.P. It may be considered as having been, on the whole, quite of average excellence. The display of pictures was large and good—that in natural history of considerable merit; the array of photographs left scarcely anything to be desired; needlework, lace, and school productions were fairly represented; and there was a remarkable show of china and other articles of the ceramic art, including some of Maw's best modern majolica. The department in which the readers of the *Mining Journal* are chiefly interested was of fair strength. Mechanics had been better represented in some previous years, but still the entries were good—and, indeed, several matters worthy of special note.

There is hardly any one point in connection with mining operations that has of late years engaged so much attention as the discovery of effective boring apparatus. For some reason or other, although boring machines are at work in almost every other part of the world, they have never yet been able to maintain a hold in Cornwall. Many of them have been too complicated; with others there have been great difficulties with regard to the transmission of power; but whatever the cause has been the fact remains—many boring-machines having been brought into the county chiefly by the Polytechnic Society, but not one is in practical use there. Last year, however, at the meeting of the Miners' Association, Mr. Jordan gave a description of Darlington's Rock-Borer, which commended itself at once as being likely to answer. This year the machine itself has been forwarded and put to actual trial. Darlington's Valveless Rock-Borer is the simplest ever made. The only moving parts are the piston which carries the borer, a spiral arrangement with ratchet-wheel for turning the borer, and the feed gear, which is turned by hand. The piston is really a slide-valve. The machine is, therefore, simplicity itself, and it is not easy to imagine a condition of circumstances short of a general smash under which it would get out of order. The steam is admitted to the different parts of the cylinder by the movement of the piston only. Entering first beneath the piston, it acts upon a free annular space under the piston, and raises it until it comes to a point where the steam way to the upper side of the piston is opened. The difference in the areas of the upper part of the piston and the annular space below being considerable, the steam above there drives down the piston, and with it the borer, with great force. As the piston passes down it cuts off the steam from the upper part of the cylinder, and the process is repeated. The machine is capable of giving from 300 up to 1000 blows per minute, and was worked up to its highest speed in the trials, when it drove through over 20 in. of granite in 9 minutes. The actual boring apparatus works in a slide, along which it is advanced by a screw, moved by hand, and the total weight of slide and machine does not exceed 100 lbs. There is an excellent arrangement for fixing it in the levels, the stand consisting merely of an iron horizontal bar, held in position by a screw arrangement. Upon this the machine is so fixed that it can be applied in any required direction. The judges reported very highly of the machine, and awarded it a first silver medal. We hope to see it soon at work in the county. There can be nothing simpler, and it proved itself thoroughly effective.

The greatest novelty in the exhibition was the Patent Magnetic Ore Separator shown by Mr. King, which is employed in extracting the ores of iron after previous treatment to render them magnetic, if not naturally so, and its special claim is its adaptability for assorting ores that from their similar specific gravities cannot be separated by ordinary dressing operations. It is at the present time in use in the Ballycorkish Mines in the Isle of Man, for the separation of spathic iron from blende—a combination hitherto of very little value. By Mr. King's treatment, however, the mixture, though it contains at first 25 per cent. of iron, will assay after treatment 46 to 50 per cent. for zinc. The process is very simple. The stuff is crushed, and then passed through retorts. Spathic iron is not magnetic, but becomes so by the discharge of the carbonic acid in the roasting. Then the magnetic apparatus comes into play. This is a drum or wheel, about 18 in. in diameter, and 10 in. broad. In the interior are placed a series of magnets, radiating towards the periphery of the wheel. The wheel is covered by an endless linen band—a band of copper has been used—which fits closely to it, except at one point, where it passes round a small roll. There are two receiving compartments, one for the iron and the other for the separated ore. The prepared ore is fed from a hopper at the top of the wheel. As the wheel travels onward the magnets cause the magnetic portion to adhere, the non-magnetic part falling over the wheel into the first compartment. The adherent magnetic portion passes round under the bottom of the wheel until it comes to the point where the band travels round the roll. Here the magnets cease to act, and the iron drops off. The process is repeated, one wheel being placed below another, until the stuff is perfectly cleaned. The cost of dealing in this manner with the ore at Ballycorkish is said not to exceed the sum of 4*s.* per ton. There can be no question that for the separation of iron ores for blende the apparatus is a perfect success, but it remains to be seen how far it can be applied to the mixed tin and

copper ores of Cornwall, which there is so much difficulty at times in knowing how to dress, and what for. Mr. King states that by his process of calcination—or perhaps we should rather say roasting—he can render the copper pyrites so magnetic that he can effect their separation from the tin without difficulty. This has yet to be submitted to the test of trial. There is another point, also, to be considered—the adaptability of the plan to cleaning tin ores from wolfram, which Mr. King also believes he can accomplish. If the Magnetic Separator will answer such ends as these it will be a most valuable addition to our Cornish mining apparatus. It is simple and cheap, and cannot cost much to work. A first silver medal was awarded, and the special premium of 5*l.* offered by the Editor of the *Mining Journal* for the best paper containing an account of any methods or plans, practised in any other mining district, applicable to the Cornish mines, to a descriptive paper which accompanied it.

A beautifully made model of Macarter's Patent Condenser, exhibited by the manufacturers, Messrs. Huxham and Brown, of Exeter, was very closely examined by the judges. It is an article of a rather numerous family, but its novelty and its merits are unmistakeable, and won for it the highest award in the power of the Society—a first silver medal. It is claimed for this condenser, which has been successfully tried over two years, that it can be attached to any high-pressure engine, whereas in many cases these engines cannot be stopped long enough to allow of the attachment of an air-pump, that it has no air-pump, and consequently saves the power required to drive it, and the accompanying wear and tear and costly repairs; that no alteration of engine is required; that only half the usual quantity of injection water is needed, which may, moreover, with impunity be salt, sandy, or muddy; that it may be placed anywhere in or near the engine-room, without any foundation, and may be made to fit any shape; and that a vacuum of 25 inches is absolutely guaranteed. These are all points of great importance, but they appear to have borne the test of experience. The condenser consists of two chambers—one, and that considerably the larger, above the other. The exhaust steam enters the upper chamber near the top, there meets the injection spray, which comes in at the top, and falls to the bottom condensed. To remove the condensed water a vacuum is alternately created and destroyed in the bottom chamber by the working of two small tappet valves. When the vacuum is created the water is drawn into the bottom chamber; when it is destroyed the water falls from the bottom chamber into the waste water sewer. The only working parts of the condenser are the two small tappet valves, and as they are in equilibrium the amount of power required to work them is not only very small, but the wear and tear is reduced to a minimum. When the engine is started the tappet shaft has to be turned by hand to exhaust the air. The engine is then set going, and the tappet thrown into gear. It needs only to be driven at the rate of seven revolutions a minute. The vapour used for destroying the vacuum in the bottom chamber is reduced by a reducing valve to 1 or 2 pounds above atmosphere, which is found to be amply sufficient. The vacuum remains long enough to render it unnecessary to start the tappet shaft by hand after there has been a stoppage for a meal, and when it has to be started it requires no exertion beyond the strength of a child. There is thus every reason to believe that in this apparatus the Polytechnic Society has introduced into Cornwall one which, when applied to such engines as it will suit, would be productive of great economy. Jacketing does not improve the efficiency of the condenser, and the water is discharged much better than with an ordinary air-pump—another important consideration.

A very ingenious contrivance, which the inventor calls a Muller Hammer Stamp, was shown by Mr. Rodda. A series of stamp-heads are set to run perpendicularly of guide-holes around the circumference of an horizontal wheel, similar holes in a wheel above keeping them perpendicular. The heads work in a circular trough bed, the bottom of which consists of a series of inclined planes, each terminating suddenly. Power is applied to the large wheel, and it travels round carrying the stamp-heads with it. As it turns the stamps pass up the inclined planes with a muller action, and at the termination of the planes drop with the action of an ordinary stamp. The process is continually repeated, and the inventor claims that this combination of rubbing and stamping renders the apparatus peculiarly suitable for heating gold quartz, tin rows, and for acting on an amalgamator. The model works well enough, but the utility of the apparatus in practice is more than doubtful. If it were fed very slowly so as to preserve the continuity of the series of inclined planes, upon which the entire action depends, the wear and tear would be very great, and little work would be done; if fed rapidly neither mulling nor stamping would take place, and in any case the friction would be considerable. Mr. Rodda arranged the apparatus as if driven by a windmill, and the judges while making no award, expressed an opinion that wind-power was not used in the county to the extent that it might be. A case of beautifully made models of mining tools by the same exhibitor received a first bronze medal.

A Copper Hole Charge, shown by Mr. Messa, had some ingenuity, but was not calculated for practical adoption. Its object was to deliver the whole of the powder at the bottom of the hole so as to prevent accidents in tamping. The contrivance consisted of a copper tube, with piston and graduated piston-rod. The powder was to be put in the tube, the quantity measured by the scale on the rod, and then placed at the bottom of the hole by the insertion of the tube, the side of which was grooved to take the fuse. Far more useful were Abegg's Blasting Sticks, shown by Mr. Darlington, and which are in continual use in the mines of Germany. They consist of percussion fuses at the end of stricks, fitted with wires for discharge by electricity. The dynamite is placed in the hole, the stick inserted, the water tamping poured in, and the connection made. They may be used either singly or in series, and are not only safe and efficient, but cheap.

An improved Miners' Theodolite, by Mr. E. Newton, received a second silver; and he was also awarded a second bronze, for improvements in a metallic parallel ruler. One of the improvements in the theodolite consists in the substitution of slits for threads; and another in the fact that the more delicate portions of the instrument are made moveable, so that they may be preserved from injury when it is in use underground.

Captain Maynard, of East Pool, continues his series of sections of various mines, and sent to the exhibition an interesting and valuable section through Cook's Kitchen and the mines adjoining, with an illustrative paper. He also forwarded samples of wolfram, tungstate of soda, tungstic acid, and tungsten. For the sections he was awarded a prize of 2*l.* 10s.

Among miscellaneous exhibits in the mechanical department, there shou'd be specially mentioned the large and fine display made by the Silvertown India-rubber, Gutta-percha, and Telegraph Works Company. They exhibited a case of specimens of submarine cables, rubber goods, Preece's patent telegraph signals, torpedo and other batteries, chiefly on the Leclanchè principle, &c., and received a first silver medal.

Sections of the lead-producing districts of Cornwall, carefully drawn, and accompanied by three series of each specimen, illustrative of the different strata, were shown by Mr. T. Clark, who received a first bronze medal.

Samples af a new Corniah manufacture—that of sardines (which are nothing more than small pilchards)—carried on by Messrs. Fox and Fryer, at Mevagincy, also received a first bronze, as being of the first quality.

The President, in his address, made important reference to the question of our coal supply, which had an important bearing on that great mining county. He saw by the Coal Commission Map that the coal imported yearly into Cornwall was about 500,000 tons. Now, the question was, was that large quantity used to the best advantage, or even nearly so. In Cornwall, where freight has to be added to the first cost, it was a question of greater importance even than in the coal-producing counties. He knew from experience and observation in Wales that there was a very considerable waste. What was the meaning of the dense black smoke pouring out of the stacks and chimneys but waste of fuel? What was the so-called topping—or flame coming out at the top of chimneys at night—but waste of fuel? What the burning ash heaps of works but waste of fuel? There were many other indications of the same sad waste, independent of any unavoidable waste in the "getting" of the 120,000,000 tons of coal which are worked annually in the United Kingdom. He did not mean to say that in the present day all, nor even a very large proportion, of this waste was to be avoided, but he thought it was, perhaps, the very first matter which should have the attention of such useful and scientific societies as the National Society of Mechanical Engineers, and local societies such as the Polytechnic and the Miners' Association. The problem to be solved was the most economical use of fuel for all practical purposes. Were they in Cornwall making forward steps in this matter? This was a very serious question for all interested in the welfare of the mines, and who was not interested or intimately connected with their welfare in such a county? It was true that the value of coal had gone down considerably since he addressed them in the previous year, but his opinion was that what might be called the normal or average price in future would be far above what it was before the commencement of the previous high prices. He had formed this opinion because he did not think, in the first place, the cost of labour would ever go down again to what it was before, nor did he believe that materials would. Then, as the coal mines got deeper, and the workings were further from the shafts, the cost of the raising of coal must be increased. From these circumstances he held that the average price in the future would be far in excess of what it had been in the past. Under these circumstances it surely behoved them all to look well into the application of their fuel, and to see that they made the most of it. They ought to satisfy themselves year by year that a ton of coal not only did as much duty as it did 30 years ago (when Cornish pumping-engines used to raise more than 60,000,000 lbs. 1 ft. high for every bushel of coal consumed), but that it did far more; in fact, that they were going forward and not backward in the application of fuel. If they did not keep their eyes open to such matters they could not hope in Cornwall to continue to hold their proud position in the mining world, and to be able to compete successfully with countries possessing superior natural advantages in richer mineral deposits. It was only by the application of scientific thrift and practice they could hope to encounter successfully these advantages, and they should watch eagerly every opportunity of carrying this out in practice.

MINERS' ASSOCIATION OF CORNWALL AND DEVON.

The annual meeting of the Miners' Association of Cornwall and Devon was held in the lecture room of the Polytechnic Society, at Falmouth, on Wednesday,—Mr. W. C. PENDARVES, the president, in the chair, who opened the proceedings with a congratulatory speech, in which he pointed out that in times of depression it was all the more necessary that mining should be conducted on a thoroughly scientific basis.

The Rev. SALTREN ROGERS read the report of the council, which expressed their regret at the loss of Mr. Frederick Hill, who had long taken a lively interest in the work of the Association, having been present at the first meeting at which the Association was formed. He was also a member of the executive council. They recommended that Dr. Hudson, of Redruth, be requested to take his place on the executive council. The spring meeting was deferred till June, when it was held at Penzance, and Mr. W. C. Pendarves was elected as president for the next two years. A suggestive paper was read at the meeting by Mr. J. H. Collins, hon. sec., offering several valuable hints for extending the usefulness of the Association. One of his proposals was that a fund should be raised for meeting the grant of 25*l.* offered by the Science and Art Department for the maintainance of a student at some school of science. Mr. Collins had offered a guinea per annum towards such a fund. The council expressed their satisfaction at the impetus which they hoped had been given by the extra prizes offered last year to the study of the important and practical subjects of mining and applied mechanics. They would recommend the repetition of the offer, as they feel satisfied that there are no branches of technical instruction which are more likely to be practically useful to the miner. Satisfaction was expressed at the success with which the Association had been enabled to pursue its quiet but useful work at a time of depression in mining such as has not often been surpassed. They recommended that the prizes generously offered by the Editor of the *Mining Journal* be awarded this year as follows:—Chemistry, Wm. Rich, Redruth class; Mineralogy, W. L. Chegwidden, Redruth class; Geology, John Bennetts, Pendeen class; Mining, N. H. Tregoning, Breage class.

Mr. BENEDICT KITTO, the lecturer and assistant secretary, then read his report, as follows:—"I have much pleasure in reporting that the past year has been a very successful one with the classes. The attendance has been good, and much interest has been manifested in the subjects taught. It will be seen from the list of those who succeeded in passing the May examinations, which is appended, that eight first-classes and sixteen second-classes have been obtained in the advanced examinations. The fact of a pupil passing in this advanced stage causes him to be regarded by the Science and Art Department at South Kensington as competent to teach the subject. A large number of Queen's prizes have been obtained, and 18 have passed in laboratory practice. About 70 joined in the annual excursion, which this year was to Rosewall Hill and St. Ive's Consols Mines. At the former we were most hospitably received by Mr. Robinson and the manager, Captain Buglehole. At St. Ives Consols, also, we were most liberally treated by Capt. Gilbert and Capt. George. A good many mineralogical and geological specimens were collected, and useful information gathered. I may mention that the class at Redruth will in future have the benefit of reference to Watts's 'Dictionary of Chemistry,' that exhaustive work having been lately added to the Institution library at Redruth, by Dr. Hudson, for their special benefit."

"Coal Mining in Italy," by Mr. P. LE NEVE FOSTER, jun., Chevalier of the Order of the Crown of Italy. In this paper Mr. Foster pointed out that, while coal of the carboniferous period did not exist in Italy, there was a very large quantity of Tertiary coal, the great drawback to the utilisation of which had been the indiscriminate application of the ill chosen term lignite. Much of this Tertiary coal, however, if not quite equal to the best Newcastle, was of great value in a country like Italy, dependent on England for her supply of fuel. Mr. Foster described at great length the characteristics of the coal-bearing strata. The coal was found in two seams in clay—the upper seam 6 metres in thickness, separated from the lower, which was nearly 1 metre thick, by 8 metres of clay, which contained seven or eight thin seams. The price of the coal at the pit's mouth was 16 frs. per ton first quality, and 12 frs. for the second at the Casteani Mines. Coal mining in Italy would become a most profitable undertaking, with proper care, in the hands of English capitalists.

A very valuable paper, by Mr. ROBERT HUNT, F.R.S., on the present state of Tin Production and the Tin Trade was next read. The exports of tin of British production in 1873 and the two previous years were, according to the Board of Trade returns, as follows:—1871, 114,201 cwts.; 1872, 113,871 cwts.; 1873, 115,946 cwts. The exports of foreign and colonial production were—1871, 41,196 cwts.; 1872, 48,634 cwts.; 1873, 28,869 cwts. Of the two combined there was thus an increased export on 1872 over 1871 of 355 tons, and a decrease of 1873 over 1872 of 874 tons. It must be remembered that in addition to the tin from Banca and Billiton a new tin-producing district of great value was being opened out in Malacca Peninsula, and that an English company was commencing operations in a large and promising district of Siam. The quantities of tin received from Australia had largely increased, and there was no prospect of any falling off in the supply while a district in Tasmania was now claiming attention, which Mr. Hunt had been assured by Mr. Gould, of the South Australian Geological Survey, far exceeded that of Queensland in productiveness. The only course open to the British miner for checking the importation of foreign and colonial tin appeared to be the exercise of the strictest economy in every branch of production. Into the mines labour-saving machinery must be introduced, and on the dressing-floors every advantage must be taken of such scientific knowledge as was directly applicable to the separation of bodies of different specific gravity from the ore. Mr. Hunt appended a brief notice of the condition of tin mining in South-Western England during the past 10 years. In 1864 the number of tin mines was 174, producing 13,985 tons of black tin, at an average price of 60*l.* 17s. 6d. In 1873 there were 213 mines, producing 14,884 tons, average price 78*l.* 1s. In 1868 there was only 109 mines, producing 11,584 tons. The lowest price for the period was 48*l.* 10s. 9d. per ton, in 1866. The total importations of tin in 1872 were 1024 tons of ore and 8342 tons of metal and regulus. In 1873, 5612 tons of ore and 7791 tons of metal and regulus. The total production of British, foreign, and colonial tin in 1872 was 18,544 tons; in 1873, 21,193 tons, of which 9753 tons were British, which in 1872 figured for 9560 tons. It was suggested that it would have been very valuable if returns could have been given for the first half of 1874, so as to show the effect of the low standards on the importation.

Capt. WILLIAMS was not frightened about the Australian tin, though some old and expensive mines must shut-up. Prices were only sympathising with the general depression of metals. Give Cornish mining fair play, modify the Mines Regulation Act, adopt the best means, and he had no fears for the future. He thought the Miners' Association should map out the mineral districts of the county.

Mr. VIVIAN, M.P., referring to an allusion by Capt. Williams to the defects in the Metalliferous Mines Act, said that a clause therein required, in his opinion, that a separate steam-guage should be put to every connected boiler, though the Inspectors in Wales did not think so. Though several steam-guages were not really needed where connected boilers were tolerably close to each other, yet he had though it best to put one to each. What was wanted in Cornish mining was the strictest economy, and the utmost attention to progress; then he thought they need never despair.

Some remarks were subsequently made on the question of coal supply, and the testing of coal. The Rev. SALTREN ROGERS suggested that turbine wheels should be introduced.—Mr. KITTO reminded Capt. Williams that the lodes were laid down on the maps of the Geological Survey.

The next paper was that recommended by the Polytechnic Society for the *Mining Journal* special prize—"On the Separation of Ores by Magnetic Power," by Mr. F. G. King. In most of our metalliferous mines ores of several kinds are produced from the same lode, which is the business of the dresser to separate. Where the specific gravities vary considerably this is not attended with much difficulty, but where such ores as blende are associated with spathose iron, iron pyrites, or copper pyrites, all ores of similar specific gravity, a perfect separation is impossible by hydraulic means, and such ores are frequently unsaleable from the low percentage of metal, or from the injury caused by one metal in smelting the other. The latter is especially the case where iron and copper pyrites occur with blende, the smelter obtaining only hard spelter. The author had his attention directed to this subject by being interested in a mine where the ores from the veinstuff consisted of lead, blende, and spathose iron. The lead was dressed without much difficulty, but owing to the similar specific gravity of the blende and iron these could not be separated, although the best known methods of sizing and mechanical dressing were resorted to. This is not surprising when it is known that the specific gravity of blende is about 4·0, and that of spathic iron 3·85. The blende received from this mine being about three times as much as the lead, it became essential that the blende should be made marketable. In carrying out various experiments upon these ores it was found by the author that the iron being composed of protoxide of iron and carbonic acid ($Fe\,O, CO^2$) would at a dull-red heat part with its carbonic acid, and become then a magnetic oxide of iron. It is necessary, however, that this heating should be done without access of air, or a higher oxide, which is more magnetic, will be produced. The process is now in operation at the Ballycorkish Mines, Isle of Man, and the agent reports that it is rendering veinstuff that has hitherto been unmarketable, and commonly discharged with the halvans, of high commercial value. The treatment adopted is as follows:—The blende and iron ores are fed through a hopper into revolving iron retorts heated by a fire beneath, and are delivered when heated to redness in a close chamber. The ores thus prepared are carried by an elevator to the magnetic machine, which consists of four magnetic wheels, the magnets being so arranged that the whole surface of the wheel is magnetic. The ore falls upon a band which passes round the wheel. This band is made of any thin material that allows the magnetic force to pass through, and the blende not being held to the wheel falls into a shute, and is received into barrows while the iron adheres to the wheel and drops into another shute at a point where the band is removed from contact with the wheel by means of a roller. In the separation of copper pyrites or iron pyrites from blende the treatment is somewhat similar, but the heating process is more simple, as access of air during the heating is an advantage. The result of the application of heat on pyrites is to remove a portion of the sulphur, bringing it to the condition of magnetic pyrite, which occurs as a distinct ore in some mines, and its composition is represented by $Fe\,S^8 + 6\,Fe\,S$, while that of iron pyrites before heating is $Fe\,S^2$. From the data already obtained, it is found that although the arrangements for heating ore are not yet perfect, these ores can be heated at a cost of about 3s. to 4s. per ton, including fuel, attendance, &c.; and that blende ores hitherto unsaleable can be brought to a value of 3*l.* to 4*l.* per ton. The author trusts that this result is of sufficient importance to justify his bringing the subject to the notice of the Miners' Association of Cornwall and Devon.

Mr. KING (the inventor) briefly explained the action of the model of his machine, which was upon the table, and answered a series of questions put to him by the gentlemen present. He believed the calciners in use in the county would be suitable for treating copper pyrites in mixed ores.

Capt. WILLIAMS said there was undoubtedly a great quantity of iron in the Cornish tin, and he thought the machine should certainly be tried.

On the motion of the Rev. SALTREN ROGERS, it was decided that the trial of the machine should be referred to a special committee.

"SOMETHING ABOUT COLORADO, ITS MINES AND MINERALS."—This was an excellent paper by Mr. ERNEST LE NEVE FOSTER. Colorado was rich in various minerals and metals, besides having large areas of very fertile agricultural land. Coal, probably of the Tertiary period, was found near Golden City, in the foot hills of the Rocky Mountains, and at Canyon City, in Southern Colorado, in large quantities, and was mined and extensively used. There were also deposits of iron ore at present little worked, but which probably in course of time would become of great importance. But the chief mineral resources of Colorado were its gold and silver lodes in the Rocky Mountains. Central City was the centre of the gold district, and Georgetown of the silver region. Gold was first discovered in Colorado in 1858. The high price of labour and materials had made it impossible for all but the best mines to pay the cost of extracting the ore from the lodes. The gold was extracted from the pyrites and quartz either by the stamp-mills or by smelting in a matte in a reverberatory furnace with silver ores, the matte being either shipped to England for treatment, or the gold and silver being extracted by Ziervogel's process in operation at Black Hawk, under the superintendence of Mr. Richard Pearce. The ore was measured by a cord of 4 ft. by 4 ft. by 8 ft., or 128 cubic feet, instead of being weighed. The mines in the immediate neighbourhood of Georgetown are true silver mines. They were discovered in 1859, and at first worked for gold, little business being done until 1864. When they commenced working for silver many large and valuable lodes had been discovered, and development was still extensively going on. The ores were of two kinds—the surface or decomposed ores, then called sulphurets, but probably carbonates, oxides, and bisulphides of the various metals. Secondly, the heavy or solid ore, chiefly galena and zinc-blende, mixed with which, however, were the true silver minerals, chiefly ruby silver and brittle silver. Some silver glance had also been found. Mr. Foster was of opinion that some of the so-called brittle silver was only a silver-bearing fahlerz. The produce of the ores ranged from a few ounces to many thousand ounces per ton, but on a fair average the produce would be about 200 ozs. per ton of 2000 lbs. The ores were either shipped to Europe or treated on the spot by chlorination or amalgamation, or by smelting to a matte in a reverberatory furnace with auriferous ores, this being treated by Ziervogel's process. With these ores occurred quartz, heavy spar, calc-spar, fluor-spar, calcedony, and many minerals of rarer occurrence, among them Petzite, or Sylvenite, bismuth silver, pitch-blende, aranite, scheelite, and native silver.

Mr. KITTO, the Lecturer, read "Notes of some Beds of Sand and Clay at St. Agnes." The beds of fine clay and sand which occur at St. Agnes were, he thought, without exception, the most remarkable and puzzling to the geologist of any of the formations which occur in Cornwall. They are found at the foot of the beacon, extending round the northern, western, and eastern sides of the hill, but not continuously, although nearly so, while on the south side they disappear altogether. They lie about 375 ft. above the level of the sea. The thickness of both sand and clay varies very considerably, and in some places one or the other is entirely wanting. One section on the western side gave soil 1½ ft. (coarse, earthy, yellow clay, containing much rubble and many rounded pebbles), 5 ft. of fine blueish clay, about 5 ft. of angular and water-worn stones and gravel—about 1 ft. under this the blue clay occurred again. Here the sand was entirely wanting. Mr. Kitto described other sections, in some of which were layers of white, pink, red, and yellow sand, the lines of separation being generally sharp. The coloured sands when washed lost their colour.

COAL MINING IN ITALY.

By P. LE NEVE FOSTER, jun., C.E., Chevalier of the order of the Corona d'Italia.

THE MINES OF MONTE RUFOLI.

SIR,—In a former number of the *Mining Journal* I gave an account of some of the principal coal mines in the Tuscan Maremma, but at that time I had had no opportunity of visiting the mines of Monte Rufoli, which, next to those of Casteani (which I have already described fully), are the most important that are as yet worked in Italy. The coal basin of Monte Rufoli—or, rather, Podernuovo, as that part of the estate is called—is situated in the valley of one of the numerous tributaries of the River Cecina, about 5 miles from the small village of Serrazzano, where one of the establishments belonging to Count Lardarel, for the extraction of boracic acid, is in operation. These mines are the property of the Società Carbonifera di Monte Rufoli, who have worked them, more or less, for the last 15 years; but until 1870 little was done beyond getting out the coal, on the most unscientific principles, from the workings near the surface. Under the able direction of Mr. W. Weber, the present engineer, the mines are now thoroughly being opened out, and in the course of about a month it is expected that the regular excavation of the coal will be begun. The coal is found in two seams in the clays belonging to the Lower Miocene period, and locally termed "mattajone," which lies immediately above the *Alberese* limestone of the Eocene formation, and which in many places has undergone a complete change, from the intrusion of the serpentine rocks, which have evidently been the disturbing elements in this district, and form the nucleus of the whole range of hills bordering on this valley. The section of the strata is as follows:—

Clay (locally termed "mattajone"	Variable.
Limestone breccia	Meters 0·50
Sandstone (grès)	0·30
Coal	1·00
Band, or parting, of grès	from 0·30 to 0·50
Coal of slightly inferior quality	1·00
Clay ("mattajone") forming the bed.	

The clay appears to be of marine origin, and contains a great quantity of shells, the principal varieties belonging to the genera *conus*, and *arca*. The grès, or sandstone, which forms the roof and parting of the two seams of coal, is evidently a fresh-water deposit. The upper seam, which contains the best coal, appears to extend over the whole of the basin, whilst the lower one only is found towards its centre. The three upper levels are reached by a day level, 380 meters in length, driven in the hill-side, and is substantially walled for its entire length.

The engine-pit (Il Pozzo Teodoro) is sunk to the fifth level, at a depth of 50 meters below the surface, and to meet the seam at this point it is estimated that it would have to be sunk 100 meters more. A horizontal engine of about 20-horse power, and winding gear complete, are now being fixed, and everything being prepared in readiness for working these mines, which are estimated to yield 100 tons daily. There are two other shafts for ventilation.

As this coal is subject to spontaneous combustion from the oxidation of pyritous matter that it contains, it is found advisable to drive all the levels in the clay, about 6 meters above the coal, and then by means of horizontal cross-cuts, driven at intervals, to intersect the seam; the coal is wrought on the long-wall system, and the space from which it is extracted is filled with earth; it is almost impossible to draw the props, but as the roof is good comparatively little timber is used.

An inclined plane is being driven from No. 3 level to No. 5, and by means of this the coal will be lowered, and then conveyed to bottom of engine-pit. A railway has been made from these mines, and following the course of the torrent Sterza, reaches the line of

the valley of the Cesina at the station of Casino di Terra, a distance of 16 kilometers (about 10 English miles). Besides the carriage of coal, there is also a considerable traffic on this line of charcoal, bark, timber, &c., which alone pays the working expenses.

The coal from these mines, of first quality, is sold at the station of Casino di Terra at 18 frs. per ton; the inferior quality fetches 2 frs. to 3 frs. per ton less. There are many other deposits of coal in this neighbourhood, and especially towards Monte Verde, which might be successfully worked if capitalists could be induced to embark in such undertakings in Italy, and notwithstanding the present reduction in price of coal in England, I do not anticipate that this would affect in the slightest degree the sale of Italian coal, which will always command a fair price for home consumption.

P. Le Neve Foster, jun., C.E.

Rocca Strada, Tuscany, Aug. 17.

COAL IN THE WEST INDIES.

Sir,—I see in last week's *Mining Journal* that you notice the discovery of coal in the West Indies. Mr. Powell and myself were one day on a visit to Mr. E. L. Carter, lessee of the salt pond of Anguilla from the Crown, who kindly placed a horse and guide at our disposal. On visiting the bay on the north side of the island, opposite to Sombrero, the phosphate island, and not more than 100 miles easterly from St. Thomas, on the line of route of the Pacific and Colonial steamers, there is coal, and the most excellent fire-clay underneath the coal—a better quality is rarely, if ever, met with in England—for fire-brick or terra-cotta purposes. The rise seems uniform, and to the north-east, forming an angle of (say) 15° or 20°. The outcrop is near the sea level, and the dip is under a bluff, or hill, rising 200 or 300 feet high direct from the beach. Had more time been at our command we should certainly not have left until we had made a thorough and full exploration of the place. As to there being coal and clay I have no manner of doubt, and as to the extent and quality of the coal field we have reason to think it to be good and immense, but this could be alone known by proving more fully.

Mr. Powell, of North Devon, writes me thus on the matter:—"If I had 1000*l.* I would place it at your disposal immediately for the working of the coal at Anguilla, for I firmly believe there is a fortune there."—*Bolton, Aug.* 24. C. Bradley.

SASSO FORTE COLLIERIES COMPANY.

Sir,—As I know something of Captain Jacob's case, I must say I was rather surprised at his letter in the Supplement to last week's Journal, in which he calls himself "mining engineer," and in introducing which you style him the "engineer of the mines." In the first place, he is not the "engineer of the mines." Some time ago he was "captain of the mine," but he was dismissed by the board for absence from duty, and he has since threatened an action against the company for the paltry sum of 140*l.*, which the company have referred to their solicitors. He only holds five fully paid-up shares in the company of 10*l.* each. As to his questions, the answers are:—

1.—The title of the property was investigated by Signor Pardossi, of Leghorn, and Messrs. Newman, Dale, and Stretton, of London, before any of the vendors' shares were delivered; and as to the "claims on the estate," the company know of none. The vendors covenant for an unimpeachable title.

2.—The property purchased by the company from MM. Montelli includes not only the mineral rights but also such surface as the company may require for their works. For any extra land required the usual compensation in such cases is provided for.

3.—The land occupied by the road from I Gessi to the mines has been gratuitously given by the proprietors to the company, with the exception of about 9*l.*, which was paid for knocking down a shed. The proprietors were only too glad to have the road made, for manifest reasons.

4.—The exact cost of this road can be readily ascertained by an inspection of the accounts; and as to whether it "is now, or ever can be, made practicable for carts," Mr. Jacob knows as well as any man.

5.—The directors have, from the explorations made, still grounds for believing in the existence of 9,000,000 tons of coal, and one of Mr. Jacob's own reports confirms this.

6.—Many steps have been taken towards laying out the colliery, and among them plans have been made by Mr. Jacob himself, and in the space of about two months the necessary works will be completed, which will ensure a minimum output of 300 tons a-day, which can be increased tenfold if necessary. Mr. Jacob knows that with a very small outlay the company has already raised a considerable quantity of coal and sold it.

7.—The amount af money already expended is about 11,000*l.*, of which over 10,000*l.* has been expended in Italy in works, plant, and machinery:—

1.—The cost of administration is included in the 11,000*l.*, but the directors, as yet, have taken no fees. The money spent has been their own and that of their friends.
2.—The survey for the railway only cost 300*l.*—*i.e.*, 23*l.* a mile.
3.—The buildings cost very little. Mr. Jacob can see the accounts.
4.—The road; the accounts show.
5.—The account of the live stock Mr. Jacob can see at the works, near where he lives in Italy.
6.—The plant and tools, ditto.
7.—As to the cost of pits, galleries, &c.—see accounts.
8.—As to cost per ton—see also accounts; it is about 2s. 6d. per ton.
9.—Actual cost of carriage of coal from mines to railway station, about 5s. 6d.
10.—Actual cost of warehousing and sale of coal at Leghorn, about 1*l.* a-week.

8.—The actual amount of coal sent away is about 1200 tons. The amount it realised can be seen from the books. Some fetched 35 frs. a ton—a profit of 20 frs., or 14s., a ton. The outcrop, of course, fetched much less. All the coal sent to Leghorn has been sold.

9.—The quantity of second quality sold, at the pit's mouth, to the Copper Mines Company close by, at 17 frs. per ton, can be ascertained at Rocca Strada, where Capt. Jacob lives.

10.—The contract with the Roman Railway, Mr. Jacob alludes to, is not secured, but inasmuch as the Roman Railway would save 70,000*l.* a-year by burning our coal, it is easy to see they will take it when they can get it.

11.—The total amount of the liabilities of the company in Italy is under 1000*l.*, and is provided for.

12.—The vendors have only received about 18,000*l.* in shares up to the present time, and they have never been greedy after them. They have the fullest confidence in the soundness and the success of the undertaking.

13.—If Mr. Cramillo Montelli, the company's manager, has misapplied any of the money on other works, the company have plenty of security in his undelivered shares.

14.—It yet remains to be seen whether the manager has "drawn half the profits" on the "provision stores." If he has he will be punished summarily.

15.—The "brass band" is an amusement of the manager's, who was for some time impresario of the Opera Comique, in London, but now his duties in Italy are at an end, doubtless the "brass band" will not again be heard of.

16.—Mr. Wild has been paid nothing for his mission to Italy as yet, but the result of it has been a full confirmation of the quantity and goodness of the coal.

17.—The company is always paid for the hire of its horses.

Had I not a large stake in this company, and full faith in its future great career, I should not have taken the trouble to dive into all these questions and make myself a complete master of them. In conclusion, I find that Mr. Jacob's assertion that he sent a list of these questions to the board is utterly untrue; and, therefore, his letter to you looks vindictive and malicious. The company has lately entered into a contract for the railway, which will give a return to the shareholders of at least 15 per cent. dividend.

London, Aug. 25. A Large Shareholder.

CLAPP'S COAL-CUTTING MACHINE.

Sir,—I have read with much interest the report in the *Mining Journal* respecting my coal-cutting machine, but as it has been stated by some persons that where the roof is soft or sticky 1-in. holes should be drilled in about every three yards along the face, and small charges of powder used to blow down the coal, I must request you to permit me to state, in order to prevent a false impression being created, that I quite agree with you that an effective coal-cutter should dispense with powder. As to the working of my machine, a competent authority in these matters remarks that "the experiments made at Newport tested the powers of the machine very fairly. A large block of Bath stone, 2 feet thick, was bored with the greatest ease in two minutes. A large piece of coal was also tried, and the experiment was equally successful, as far as it went, for the coal could not be kept in position so well as the Bath stone, the latter being much larger and heavier. Mr. Clapp has been several years at work on this machine. He may be congratulated on the success which has crowned his efforts. It remains only for the coalowner to turn his attention to this machine, and to test its capabilities in the mine. By simplicity of construction reduced expense has been secured, and an ordinary man may work it. This machine is also capable of being worked by hand. In that case the number of borers would not be so large—say, not more than three—as where the motive power is steam or compressed air. Where hard coal has to be cut the inventor recommends 9 drills, but for softer coal 11 to 13 may be used. Where the roof or the parting is hard stone or shale the wedge may be employed to bring down the coal. The amount of work that can be done by one of these machines is equal to that of nine or ten men employed in "holing-in" by the pick in the ordinary way; and for attending the machine when at work one man suffices, whilst for removing and readjusting two men only are required. It is, further, worthy of remark that the machine can be easily adjusted to the face of the coal, whether it is straight or slanting."

All this is quite true about the machine, and I will undertake to say that when it is used no powder will be required. The holing having been completed, it will be found quite sufficient to use wedges to bring down the coal. I send you a photograph of the machine, and will thank you to allow those interested to inspect it at your office.—*Nant-y-Glo, Aug.* 24. W. J. Clapp.

CLAPP'S COAL-CUTTING MACHINE.

Sir,—In order that no complaint may hereafter be made that I have acted harshly in endeavouring to protect my rights as the inventor of the machine now pretty well known in connection with my name, I subjoin copy of a letter which I have to-day sent to Mr. Norris, and from which you will see that I am the original patentee of the multiple drilling machine for coal-cutting, &c.

Nant-y-Glo, Aug. 26. W. J. Clapp.

Sir,—I have this day received your specification for a patent coal cutting machine. It appears you took your patent out on Jan. 9, 1874, No. 132. Herewith I send you specification and photo of my patent for a coal-cutting machine, &c., which I took out May 27, 1873, No. 1990. You will please compare the two specifications, when you cannot fail to perceive that your patent is clearly an infringement in some of its parts upon mine; and I, therefore, beg to call your attention to the fact. The notice in the *Mining Journal* is quite sufficient to cause me to take legal steps had I not told you at Dudley you were trespassing upon my patent; but I trust you will give me an assurance that you will not infringe upon my rights. In that case I will not seek any legal remedy, but think it is due to you to say that if you do not give me such an assurance during this week that you will not infringe upon my rights, I must, in self-defence, file a Bill to protect my patent. I am sorry to have to write so strongly, but one does not expect to see time and money thrown away.—*Nant-y-Glo, Mon., Aug.* 26. W. J. Clapp.

Richard Stuart Norris, Esq., Kenyon, near Manchester.

NOVA SCOTIA LAND, GOLD, AND QUARTZ CRUSHING COMPANY.

Sir,—As the ex-local director, Mr. William Annand—to whom has been ascribed by the local press, and no less an authority than the late Governor Howe, the failure of the above undertaking—is now in England, might it not be well for the shareholders to demand an account of his stewardship before he leaves this country? Though for some years the self-appointed leader of the executive council, he is held in that estimate in the colony that not one constituency can be found to return him, and the seat occupied by him in the local Cabinet is the only one independent of local suffrages.

Aug. 2. A Sufferer by the Failure.

SULPHUR IN ICELAND.

Sir,—It seems to me evident that Dr. Blake, whose pamphlet on Sulphur in Iceland you reviewed in last week's Journal, writes in perfect good faith. But, as you very justly observe, he does not claim any special acquaintance with the matter, and, this being the case, it is not surprising that he should have fallen into many errors. A few of these I propose, with your permission, to point out.

At page 7 of the pamphlet Dr. Blake informs the world that "sulphuric acid is so called because made from sulphur," which is to a great extent true. But when he proceeds to give statistics (and very stale statistics they are) of alkali and manure manufactures, he implies that the sulphuric acid used in them is made from the kind of sulphur which is found in Iceland. Here I cannot acquit him of culpable negligence, because very little intelligent enquiry would have prevented him from promulgating an impression so erroneous. The fact is that all the sulphuric acid now used in those industries is derived from pyrites, with which brimstone above 5*l.* a ton cannot for such uses compete. True, if we find later on that Dr. Blake's estimates are more useful than his statistics, Icelandic sulphur could be sold at that price in England, although not with the brilliant advantages he promises to speculators in volcanic deposits in the immediate neighbourhood of the Arctic Circle, when, in counting the unhatched chickens, he assumes an average price of 7*l.* For the purposes to which Sicilian sulphur is applied the Icelandic sulphur would, of course, have a great advantage if it could really be imported at anything like Dr. Blake's imaginary cost. But his mode of calculating profits shows a deplorable looseness in the use of figures. "Italy," he says, "exported 52,546 tons in 1870, and there is every reason to believe that as large a quantity can be exported from Iceland, but, supposing that for the first year or two only one-third that quantity is exported—17,515 tons—at a profit of 4*l.* per ton, the annual profit would amount to over 70,000*l.*" Now, although I have not got the returns for the year in question before me, I have no doubt that Italy exported a great deal more than double the quantity stated, therefore Dr. Blake might as well have written at least 35,030 tons as a low estimate of the export from Iceland, and 140,000*l.* per annum as the profit thereon "during the first year or two."

This is all very fine on paper, but having, unlike Dr. Blake, some special acquaintance with the subject, I am arrested by difficulties which he gracefully skims over. These are, for instance, labour, climate, and transport. As to the first, I find nothing said about the natives, nor do I suppose that during the short season in which labour is possible anything like a sufficient number of hands for such considerable operations as are contemplated could be withdrawn into the desert from agricultural operations. Indeed, Capt. Burton, whose report is quoted, evidently contemplated the establishment of a colony of English labourers. "The vast waste lands to the east," he writes, "will carry sheep sufficient for any number of hands, and good storehouses will enable the Englishman to weather a winter at which the Icelander, in his wretched shanty of peat and boarding, looks with apprehension." What, may I ask, would be the cost of such labour, and, still worse, of such idleness, during the greater part of the year? And what about the demoralisation consequent on the latter, and on the inevitable use and abuse of the spirit of the country in order to while away the time? Or is it proposed to send out annually a large number of Englishmen for a summer trip? Or would native labour, if obtainable, be cheaper at any price?

Now, as to the carriage of a production which, "for the first year or two," is to be confined to some 17,500 tons of sulphur. Capt. Burton advises the land transport to be confined to the winter, and recommends the use of sledges—not those of the country, but the best Norwegian or Canadian. I have no information as to the weight those vehicles will carry, but I need scarcely point out that a very large expenditure in stock, both live and rolling (or rather sliding), must necessarily be involved. There appears, indeed, to be something fantastic in the idea when dealing with such a tonnage, and I think it advisable to reckon with carts for the present. Taking into consideration the roughness of the road, 45 miles in length, 1½ ton to each cart per journey appears a very liberal load, and five days a moderate time for the double distance. If the road be open for 150 working days in the year, therefore some 400 carts and 1000 or 1200 horses (leaving very small margin for accidents) will be required to carry the sulphur produced, even during "the first year or two," to the coast. A road or track of the kind must suffer immensely during the winter, and with this traffic would require constant and expensive repair, while a tramway, which is hinted at, would not only cost a very large sum of money but would be impassable, owing to snow, the greater part of the year.

I apprehend that Dr. Blake also underrates the freight to be paid on large quantities, as it does not appear that Iceland is likely to add, in relative proportion, to her imports, except to some extent, perhaps, in pressed hay and other fodder for the horses above spoken of, for which, too, a large outlay on comfortable stabling will be required where they may month after month eat the oats of idleness.

As to the scientific matters touched upon by Dr. Blake, he is naturally at sea. Flowers of sulphur, for instance, are not as a matter of fact, the purest form (as stated at page 8), they contain some extraneous matter, traces of sulphuric and sulphurous acid and of carburetted hydrogen. Richardson and Watts (2nd edition, 1863), who are quoted at page 10, describe processes which have to some extent been improved upon, and I suppose that it is to them—and not to Dr. Blake, who adopts their teaching—that we must award the credit of describing the old calcarelle as a blast-furnace, although it is, of course, without any blast. But such questions are of minor importance, and I believe that I have sufficiently shown that although the working of the sulphur deposits in question may possibly with great care and economy give moderate returns on capital; their development is not likely to revolutionise the trade in

Brimstone.

IRON IN QUEENSLAND.

To the Editor of the Times.

Sir,—Permit me to direct the attention of iron miners in England to the great wealth of Queensland in this metal, and to the opportunity offered in the Toowoomba district to persons acquainted with the business of smelting. In this young township there is scarcely a person conversant with the business, and no one competent to embrace the opportunity offered in our iron ores for obtaining the trade in iron of the Australian colonies, and perhaps of India and China.

Within four miles of the town of Toowoomba seams of iron ore have been discovered, which, on analysis, have given a return of 83 per cent. of metal, samples of which were exhibited at South Kensington and Vienna and obtained the highest averages of any of the ores on exhibition, as per analysis at the School of Mines, London. The iron country is supposed to extend over several miles of the surrounding district, inasmuch as outcrops are observable in the neighbourhood of the town and appear in several instances in the suburbs. A very fine seam, however, has been opened at Flagstone Creek, the place from which the samples sent to Kensington and Vienna were obtained. This country is open to selection at the moderate rate of 1*l.* per acre; so that to persons acquainted with the business of smelting and mining there is every prospect of fortune, the supply of ore being practically unlimited. Within one mile of the ground an outcrop of coal has been found, specimens of which were also sent to Kensington and Vienna; for an outcrop they were considered good, and from an inspection a few days ago the seam appears to be widening to extraordinary proportions. Limestone and water are plentiful in the vicinity, the ground appears admirably suited for conveying the coal by tramway to the iron ore, and the works need not be more than six miles from the southern and western line of railway nor more than 70 miles from the metropolis. Timber is plentiful throughout the district. I should have said, perhaps, above that the fee simple of these lands can be obtained at 1*l.* per acre.

With the prospect of a large extension of railways in Queensland, New South Wales, and Victoria, I should think that, combined with available business in the other colonies, the iron fields of Queensland would attract the attention of English capitalists. By a late paper I observe that the shipment of 25,000 tons of rails for New South Wales was lately arranged for in England. From this colony alone it would seem that a fair return for the cost of erecting works might be obtained, independent of other markets within reach of our colony of Queensland.—*Toowoomba, Queensland.* T. J. White.

IRON IN QUEENSLAND.

Sir,—In a letter, with the heading "Iron in Queensland," which appeared in the *Times* of Aug. 24, is the following statement:—

"Within four miles of the town of Toowoomba seams of iron ore have been discovered, which, on analysis, have given a return of 83 per cent. of metal, samples of which were exhibited at South Kensington and Vienna, and obtained the highest averages of any of the ores on exhibition, as per analysis at the School of Mines, London."

Permit me to remark that the richest iron ore in the world, magnetite, does not contain more than 72¼ per cent. of iron, even when perfectly pure; and that, consequently, the announcement of the occurrence of an iron ore in Queensland yielding 83 per cent. of metal must be erroneous. The public might be led to infer from the foregoing extract that this percentage of iron had been actually found by analysis at the Royal School of Mines, London. Now, Sir, I beg to inform the public, through you, that a report to that effect never emanated from the Metallurgical Laboratory of the School, which is under my direction; and I may add that if a student should make such a blunder at his final examination his fate would be probably sealed.—*Royal School of Mines, Aug.* 25. John Percy.

IRON IN QUEENSLAND.

Sir,—In the *Times* of to-day Dr. Percy naturally objects to being made responsible for the statement that an iron ore occurs in Queensland, near Toowoomba, which on analysis at the School of Mines gave a return of 83 per cent. of metal; in fact, an impossible iron ore. The ore in question was assayed at the School of Mines, and the return given was 51·83 per cent. of metallic iron. This assay note was forwarded by me to the colony, and the ore, with the percentage ticket attached, was placed in the Queensland annexe at South Kensington, where it still remains. The only way in which I can account for your correspondent's error is that he took an Antipodean view of this matter, and read the assay note "the reverse way," making the decimals take the place of the whole numbers.

Richard Daintree,
Agent-General for Queensland.

Queensland Government Office, Charing Cross, Aug. 27.

THE WEALTH OF CALIFORNIA.

Good Mining Prospects in the Pacific States—Extraordinary Crops—Tobacco and Cotton Fields—Warning to English Investors—The great Diamond Swindle in Court—Black-mailing the "Mining Bureau"—Arrest, Escape, and Capture of the Editor of a Sacramento Newspaper.

Sir,—It is generally admitted that the mining season is progressing under the most favourable auspices. The unexceptional abundance of rain during the winter months and beginning of the year has supplied all mining camps with the necessary quantity of water, and the best results can be expected from the working of most all mines in California as well as in Nevada. On the other hand, the people on the Pacific Coast have been blessed with unprecedentedly abundant crops, and they have rightly become most sanguine of success in every branch of home industry. Money has never been so plentiful on the San Francisco market, and it is hoped that the exports from California will still increase the monetary facilities by bringing to the Pacific States a large amount of capital from the East and from Europe.

Agriculture *v.* Mining.—As a natural consequence of the favourable impression created among the investing public here by the extraordinary crops of this year, their attention has been partially diverted from mining speculations, and there is now a universal desire to develope, with profit, the agricultural resources of California; this desire has been of late much stimulated by the successful raising of tobacco and cotton in certain parts of the State, hence, as a consequence, several land schemes have been prepared for home as well as European markets, and it is expected that they will be presented to the public with all guarantees attached to legitimate and lucrative enterprises.

Tobacco Lands.—There are now several hundred acres of land, at Gilroy, producing tobacco of a tolerable quality. The Gilroy Tobacco and Cigar Manufacturing Company have imported tobacco seeds from Havana, Connecticut, Florida, and other countries, and it is asserted that the tobacco raised from these seeds, especially from Florida and Havana, possess the qualities in strength and flavour requisite to make the finest cigars. I have had the opportunity of smoking a few of these Californian cigars, and I found some of them with a strong Havana taste, which seems to indicate that either the Gilroy soil, or the hand of the manufacturer, had sufficiently *Havanized* those which were submitted to my appreciation. The active managers of the Gilroy Company are sending, profusely, samples of their cigars to Europe, and quite a select quantity has been presented to the French Government through the Consulate of France in this city. I do not think that the real object of the Gilroy Company is the sale of their cigars, as they ask for them exorbitant prices, nearly equal to those paid for genuine Havana cigars; they cannot, for that reason, expect to obtain an important market for them in America and in Europe. But their ambition is evidently to establish, by the sale of sample cigars, the reputation of their land property, and also of thousands of acres of adjoining land, which are alleged to be able to produce tobacco of the best quality. The value of these tobacco growing lands, it is estimated, will be calculated upon the quality of the cigars sent abroad as samples, and sold at the highest prices. Should it be demonstrated that Gilroy cigars are equal to Havanas, and that there is a chance for a good market for them in Europe, the shares of the Gilroy Company would soon be worth five or six times their par value, and the thousand acres of uncultivated land adjoining the tobacco fields of Gilroy would be disposed of upon the most advantageous terms, and sought for by speculators abroad. I, therefore, consider it to be my duty to warn your capitalists and merchants against the favourable impression which may be created among them by the fine Havana flavour of the Californian cigars. The experiment, which I would advise before investing in any of the tobacco-growing land, would be to cut a plant of tobacco with your own knife, to take it home with you, then to submit it to a

tobacco expert, who would prepare it in the usual way, and would make a few cigars of it. You could then smoke at leasure a few *California* cigars, and pronounce them equal to Havanas, should you find in them that exquisite flavour which distinguish Havana cigars from any other brand of cigars manufactured outside of Cuba.

The experiment which I propose cannot affect in any way the successful progress of the Gilroy Tobacco Company, as it is identical with the means adopted for the examination of mines—in fact, it will be just as unreasonable to buy tobacco lands upon the trial of cigars alleged to be made from tobacco grown on them as it would be to purchase a gold mine upon the rich results obtained from the assay of selected pieces of quartz sent to London and alleged to come from the mine intended for sale to your investing public. Such measures of precaution as advised by me, under existing circumstances, are but elementary, and I hope that a word of warning will be favourably listened to by the numerous readers of the *Mining Journal*.

THE DIAMOND SWINDLE IN COURT.—Quite an excitement has been created by a lawsuit instituted a few days ago against William L. Lent, the president of the Original Diamond Company, for the recovery of $20,000, invested by the plaintiff, Joel F. Lightner, in the stock issued by that company. It will be remembered that among the directors of that company were some of the most influential bankers of San Francisco. W. C. Ralston, of the Bank of California; M. S. Latham, of the London and San Francisco Bank, and that they succeeded in obtaining the name of Gen. Geo. B. M'Clellan. The present lawsuit against the chief promoter will, if not hushed up by Lent and his associates, unveil some of the mysteries of that gigantic swindle, and should it be demonstrated that the directors had been deceived, they will still have to bear a terrible responsibility before the investing public in America and in Europe, as such a mistake from their part, while holding the responsible position of managers of a banking establishment, will necessarily affect the credit of their establishments, and also of the enterprises with which their name may possibly be connected in the future.

BLACK-MAILING IN CALIFORNIA.—You have probably heard that the editor of a weekly newspaper called the "People's Champion," published at Sacramento, has been lately indicted for felony, for having black-mailed Colonel Berton, President of the London and Pacific Coast Land and Mining Bureau. This man had for his object the intimidation, in a letter signed by a pseudo name, the Mining Bureau while it was re-organising with a Land Department which seemed to interfere with some land scheme in preparation by that individual and his friends. Kane, released under bail, escaped some time ago, after his indictment by the jury, but he has been captured since at Elko, in Nevada, and brought back to Sacramento a few days ago after a severe fight with the sheriff who arrested him, and who had to use the revolver and manacles in order to bring him safe to the Sacramento county jail, where he now awaits his trial before the grand jury of that city. The efficient measures taken by the sheriff for his capture, which consisted in forwarding postal cards, directed to all sheriffs in the Pacific States, offering a reward, and bearing the printed description of the escaped, with his photograph affixed to each card, reflect the greatest credit upon that public officer. The Kane incident will have a salutary effect among the editors of the San Francisco papers, many of which are known for their libellous propensities.

San Francisco, Aug. 3. CORRESPONDENT.

GOLD MINING IN WALES.

SIR,—Several articles which have recently appeared in the newspapers on the above subject so awakened my curiosity, as one who has now had over twelve years' experience of gold mines, that I resolved to go and judge for myself of the prospects of Wales ever ranking as an important gold-producing country.

My observations were limited to Merionethshire, where I had the opportunity of examining the Cefn Coch Mine, and samples from the Clogau and Castell Carn Dochan Mines, besides pieces of float-quartz on the hill sides, and road heaps on the way to Dolgelly. Though I saw no free gold in the solid, specimens were shown me from each of the mines aforenamed rich in visible gold, and the veinstuff of the Cefn Coch is remarkably like what has yielded one-third of a million sterling in the Sherbrooke, Wine Harbour, and Caribou districts, Nova Scotia. A predominance of copper pyrites over other sulphurets was the only marked difference, but galena, blende, and arsenical pyrites are quite as common as in the Nova Scotian ores.

It is my impression, then, from the wide distribution of quartz veins, resembling in so many points the productive quartz veins of Nova Scotia, that Wales will yet be an important gold-producer, if mining for gold is ever practised methodically and on an extensive scale. The present heavy royalties, 1-12th to the Crown and 1-12th to the lord of the manor, are almost prohibitory, for no industry can long survive an initial tax of 16 per cent. on the gross revenue.

The richest veins evidently have not been discovered yet, for it must be remembered that even in Australia 100,000 men were working daily for nearly 13 years before the idea suggested by Mr. Selwyn was acted upon of searching for the gold *in situ*. It is also certain that in a country where there are so many water-courses, traversed by quartz veins, which are being constantly abraded by the weather and rolling stones, alluvial gold must be found in places suitable for its accumulation.

On the whole, Wales has made a very favourable impression on me as a gold-mining country; and, although my interests are quite opposed to diverting capital in that direction, I am bound to say that the chances of its profitable employment in the Principality are extremely good, provided the mines are worked economically, the properties not purchased at too high a price, and the royalties reduced to a reasonable figure.—*Aug.* 25. ACADIENSIS.

THE MINING INTERESTS OF THE WEST.

SIR,—In answer to "W. B.," of Manchester, and to "J. E. F.," of Lincoln, I must observe that it is difficult to foreshadow, far less to predicate with any degree of certainty, the date or moment of returning confidence in Cornish mining; the elements are so conflicting and exceptionable in respect to all former epochs, that I dare not hazard an opinion upon the subject. Another year, however, will assert the true importance of Australian tin products, and in all probability legislation, coupled with the combined action of iron and coal masters, determine, or rather define to some practical extent, the relations of capital and labour, thus giving a steady impetus to manufacture and trade, while at the same time fuel will become estimated at and reduced to its fair and honest commercial worth. These questions settled, the future of Cornish tin mining can with considerable certainty be understood by all. In the interim nothing short of important discoveries of fresh deposits of mineral wealth can re-kindle confidence. What we all require is another Friendship, Levant, Tresavean, Van—or, a Phœnix in the shape of a second East Wheal Rose will awaken hope and stimulate sanguine feelings in the future. Healthy speculative enterprise will then thrive—that is, enterprise which is legitimate, and that is within the control of those engaged in it, which is ever to be encouraged, for it gives a zest to commercial life and awakens action in all engaged therewith; but when it becomes rampant and takes the form of reckless or gambling transactions, as it unquestionably did three years ago in Cornwall, when Dolcoath went to 95*l.*, Tincroft 65*l.*, South Crofty 120*l.*, Cook's Kitchen 40*l.*, and Treleigh Wood 200*l.* a share, then I say that enterprise loses its character, and those engaged in it, or who fostered and fed the flame, deserve no sympathy when failure and misadventure follow the exposure of operations that could not otherwise than end in grief.

There is, however, another light in which one may view the anomalies of the share market, and it may be fairly asked at this time whether Dolcoath shares, if too dear at 95*l.*, are not worth buying at 45*l.*; Tincroft at 30*l.*, instead of 65*l.*; South Crofty 15*l.*, against 120*l.*; Cook's Kitchen 10*l.*, against 40*l.*; and others wherein quotations compare equally favourable to investors. We are advised that each and all of the mines named are looking well for future yield, while the experience acquired from the sad reaction in gains have called forth increased supervision, retrenchment, economy, and mechanical appliances; thus working costs are lightened, and, in all probability, permanently ameliorated, so that whenever an improvement of 10*l.* a ton takes place in the price of tin the profits will become augmented in proportion, while a fall of 5*s.* a ton in the cost of fuel, and of which there is strong promise to encourage the investor, will again most favourably affect these mines.

I must now call the attention of your readers to my two letters (15th and 22nd inst.) published in your valuable columns, on the subjects of tin mining, tin smelting, merchandise, and reduced royalties or dues. These are questions of vital importance to the future of Cornwall, and I refer to them on this occasion in consequence of your report of the proceedings at West Seton Mine, wherein Mr. Marriot gave his views somewhat in detail on the subject of dues, and in respect to which I beg most respectfully, though *in toto*, to differ. His arguments are unsound and untenable. He evidently thinks that the shareholders in West Seton, who for 14 years subscribed to calls and spent the whole product in opening out the lodes, should rest satisfied with having since received 300*l.* a share in dividends, while the landlord during the same period had only, without risk, pocketed 100*l.* He also thinks that the shareholders have cause for congratulation in having a losing mine, and being compelled to erect a large steam pumping-engine, that will not only cost a large sum of money, but continue an incubus forever in the heavy expenses of fuel and repairs; and pray what is the concession made for all these negative advantages, or, rather, what in other pursuits commercial men are in the habit of calling positive dampers? Why, a reduction of dues to about 1-30th, or just 180 per cent. more than Lord Robartes graciously receives from West Tolgus, now a dividend property. Such illusory and specious arguments as were promulgated, or rather indulged in, at West Seton remind me more forcibly of the sweet warblings and pretty sayings of Miss Woolgar, in the character of Mephistopheles, than the sage arguments of Carlyle, or the profound philosophy of Socrates.

I am about to work a mine on the Dartmoor, which to me appears the most favourable district in the West for economical and successful tin mining. A few 32nds, at 125*l.* each, are for disposal to parties of high and approved respectability, and who have the patience and possess the will to wait a twelvemonth for development.

43, *Bishopsgate-street, Aug.* 26. R. TREDINNICK, Consulting Mining Engineer.

RATING OF METALLIFEROUS MINES.

SIR,—It having now been settled by Act of Parliament that metalliferons mines are to be rated, I think it time that proprietors of such mines should consider how far they are justified in continuing the "Doctor and Club" system, whereby the mining companies really (notwithstanding any contrary opinion the general public may have) pay a large sum of money annually for medical attendance, club pay, and special provision in cases of accidents. The landowner pays rates, and his employees are provided for out of the funds of the Union. The mines will now contribute largely to those funds, and are, consequently, entitled to demand that their workmen be placed upon an equal footing with those of other branches of industry.

Whilst we were not called upon to pay rates it was right that we should make special provision for our men, but now that we are to be rated there is no reason for continuing the "Doctor and Club," and thereby paying what would virtually amount to a *double rate*.

I am aware that those unacquainted with the real state of things believe the sum of 1*s.* 6*d.* per man per month is subscribed by the men, but every mine agent and purser in the two counties of Devon and Cornwall knows that such is not the case. To the working miners I say, "Form your own private club, and take it under your own management;" and to the mining companies, "Protect yourselves from double rating by abandoning the 'Doctor and Club.'" Then the employed will have the advantage of extending the usefulness of combination for their common good, and the mining speculator, who is already heavily burdened, would pay the rates cheerfully, knowing that he only contributed his proper quota to the relief of the poor.

This being a subject which seems to me to be of great importance to the mining interest, I would suggest that the members of the Mines Defence Association (an association formed for the purpose of resisting the rating of plant and machinery) should meet and discuss it in all its bearings.

Aug. 25. AN ADVENTURER IN CORNISH MINES.

MECHANICAL MINING.

SIR,—I have read the letters of Messrs. McKean and others recommending the introduction of rock drills in mining operations, with a view to economy, but I cannot find any statement which will enable me to ascertain the relative speed and cost of machine and hand driving. What I want to know is this. Suppose we keep two men in an end constantly for six months, so that the eight men—I believe each two men work six hours—will drive 24 fathoms, at 6*l.* per fathom; I should like to know how much can be done with the rock drill for 144*l.* in the same time. Not being a practical miner, my question may not be quite intelligible to practical men, but it is that which mine adventurers wish answered before they can decide by their vote whether rock drills shall be introduced in the mines with which they are connected. Messrs. McKean should show how much work in cubic fathoms can be done in six months for 600*l.* by hand labour and assisted by the drill, the drill being charged with such an amount as will replace it when worn out. Thus, if the drill cost 100*l.*, and is worn out in ten months, 10*l.* per month should be charged for wear and tear.

It would be the same thing if as many men are employed (and I believe as many men would be required with the drill as without it, though the introduction of the drill has been impeded in Cornwall because the miners supposed it would take away their work) for Messrs. McKean to show how much more work is done with the assistance of the drill. If eight men earn 144*l.* in six months—that is, 3*l.* per month each—without the drill for driving 24 fms., how long would it require to drive 24 fms., with eight men, assisted by the drill, and how much per month would they earn without extra outlay being incurred by the adventurers? To mine adventurers time is money, and if with the drill the 24 fms. could be driven in three months instead of six months, and the wear and tear of the drill is 10*l.* per month, the result would be equally advantageous to both miners and mine adventurers. The miners would get 114*l.* for three months' work, or 4*l.* 15*s.* per man per month, instead of 3*l.*, and the mine adventurers would get their work done in three months instead of six months, which would often prevent the necessity of making a call. This is the way in which the rock-drill makers should show the advantage of their machinery if they would have it adopted.—*City, Aug.* 25. ADVENTURER.

MINING IN GWENNAP.

SIR,—About a fortnight ago I read in the Journal a paragraph stating that a mine situated on the "junction of the granite and slate, in the parish of Gwennap," was intended to be offered to purchasers, or intended to be purchased, for about 20,000*l.* The same paragraph referred to an advertisement which, it was said, might be found in the same Journal. I looked through the paper for the advertisement, but could not find it. The Editor of a local journal told me he did the same, with the like result. Nor does it appear in your last number. I was very desirous of learning the old name of the mine, that, being intimately acquainted with the mines in Gwennap—as well as mines in general—I might be able to determine on the fairness of the price proposed as the purchase-money. Being disappointed in my investigation, I am led to guess the location of the mine referred to. As I do not like to act upon a mere conjecture, I shall not name the mine, but shall merely state that no mine in Gwennap is worth the money named. I think, therefore, that the investing public had better exercise a wise discretion before they enter into any speculation without being fully assured of its value. There may be many places in that parish—and I believe there are—deserving of trial; but there is no mine within its ambit for which a consideration beyond the value of the machinery, &c., should be paid.

I believe that the time has passed away for realising such large premiums as have been paid for setts—mere licences to work. The mania for mining, or, as some have called it, the "mining fever," has occurred from time to time almost like a periodical visitation. During its existence many men have made large fortunes, which, like money acquired by gambling and in other bad ways, has been and will in some way be dissipated by the possessors. Taking past observations as a guide for judgment as to the future, who, in reviewing the money lost at Terras Mine, in the enormous prices paid for shares—not in the working—can avoid the feelings of anger and disgust? The mine was brought before the public in 25,000 shares, at 1*l.* each. The promoters agreed to place on the mine all necessary machinery for the effectual working of the same, so that the lease and the machinery cost 25,000*l.*! Shortly after the scheme was published, and operations commenced in quarrying on the elvan course, which yielded tin, a mine broker, by the process of puffing, caused the shares to rise to about 3*l.* each. By this means it is said he netted 11,000*l.*! I need not tell you, or your readers, that the mine has been abandoned, and that nearly all the money paid for the shares is so much lost to those who paid it. I wish that those who have money to invest in mines would be more cautious than those who invested in Terras and similar mines.

I wonder how any man or men can be so bold as to ask the prices which have been asked for setts of purely speculative properties. I mentioned this to a broker in London, a projector of mining schemes, and his answer was this—"If we name a low price speculators will think that it cannot be worth much—in fact, undeserving of notice; but if we put on a high price they will think it a good thing because such a price is put on it—then they are likely to come in." The most extraordinary charges I ever heard of were those made for five lead mines in Wales—167,000*l.* for promotion money out of an aggregate capital of 191,000*l.* I believe the whole of the five have proved to be worthless undertakings.

A broker of the City of London, who has kept up a good appearance for 20 years, and "lives sumptuously every day," requested me at different times to aid him in procuring setts. In one case I secured a sett, which he sold for 350*l.*; out of that sum I was promised one half, but I never received more than 22*l.* 10*s.* The last case was a mine called East ——, which was brought out in 25,000 shares, at 1*l.* each: 5000*l.* was to have been the promotion money, one third of which I was to have as my portion out of the first receipts. Out of nearly 2000*l.* paid into his hands I received 2*l.* 10*s.* only. Who will dare call him other than an honest man?

Truro, Aug. 26. R. SYMONS.

IRON ORES ON THE EXMOOR ESTATE, NORTH DEVON.

SIR,—In reading your valuable Journal of last week I noticed the remarks in the letter of your Cornwall Correspondent upon the Deposits of Iron Ore on Exmoor, and learnt that it is now a matter of current report in the neighbourhood of Exmoor that a strong and powerful company of adventurers contemplate taking for a long term the Exmoor property, &c. Will your Correspondent, for the benefit of your readers, kindly answer the following questions:—1. Which of the hills on Exmoor is composed wholly of iron ore?—2. Where is there any deposit of iron ore in the parish of Brendon?—3. How they contemplate making a railway through the heart of Exmoor, and if it goes from Castle Hill to Comb Martin, or from South Molton *via* Brendon to Lynton? As one anxious that the project may prove successful, I should hope the new company of adventurers before entering into the adventure would first obtain sound advice from practical men. I would suggest such men as Mr. David Forbes, C.E., F.R.S., or Mr. Robert Smith, who first discovered the deposits of iron ore upon Exmoor.—*London, Aug.* 26. OBSERVER.

[For remainder of Original Correspondence, see to-day's Journal.]

THE MINERAL INDUSTRIES OF NOVA SCOTIA.

For some years past the name of ALEXANDER HEATHERINGTON has been intimately associated with the gold mining industries of Nova Scotia, owing to the zeal and judgment he has displayed in bringing from year to year the statistics of the business prominently before the notice of the British capitalist, and now that he is enabled to give us the result of another year's experience, it may be hoped that some really business-like movement will be made on this side to push forward the development of mineral resources of the Province. He remarks that the fact of Canada being a near healthy, law-abiding, accessible British dependency, not overburdened with wealth or enterprise, is in itself no claim upon English sympathies, unless it can be shown that so large and lucrative a field for financial adventure exists there as in the distant alien countries to which in spite of prevailing epidemics, revolutions, earthquakes, and repudiation of debt, so many millions of English capital annually flow; but, upon carefully studying the statistics to which his observations form an introduction, it cannot be doubted that he has succeeded in showing that such a field really exists in Nova Scotia, the nearest part of Canada to Great Britain, and that the comparative cheapness there of labour, freight, and the necessaries of life ought to make intelligently conducted mining operations in that Province particularly remunerative. Its coal and iron deposits have began to receive some attention in Europe, but the gold fields—to the extent and value of which Messrs. Marsh, Silliman, Hunt, Michel, Dawson, Selwyn, W. Warington Smyth, J. A. Phillips, with other distinguished geologists, and a yield of nearly 1,000,000*l.* sterling, testify—are strangely neglected.

With regard to the COAL industry it appears that the output of coal has about doubled during the past ten years, the figures for Nova Scotia proper and Cape Breton Island for 1873 being 1,051,467 tons. The prospects of other branches of mineral industry are not less encouraging. Nearly every variety of iron ore has been found in the Province, but the only smelting establishments opened are at Londonderry, Colchester county, and at Clement's Port, Annapolis county, the former now belonging to the Canada Steel Company, and the latter to the Annapolis Ironworks, from which the production was 1226 tons of pig metal. Of this the Londonderry Works, where 26 men were employed and 2947 tons of ore were mined, smelted 2091 tons of ore, and produced 1046 tons of metal; and the Clement's Port Works, where 16 men were employed, and 538 tons of ore were mined, smelted 630 tons of ore, and produced 180 tons of metal. Explorations were carried on near Springville, Pictou county, and extensive limonite deposits found; also at the Indian Reserve, Whycocomagh, at Five Islands, and near Chéverie. These localities are favourably situated for smelting works, being in the neighbourhood of rivers, beds of limestone, and large forests. Galena is the only LEAD ore known to occur in the Province. Attention has been directed to localities in Colchester, Cumberland, and Lunenburg counties, and Cape Breton, but as yet with no definite results. The late Mr. Samuel Bawden gave a favourable opinion of the Gay's River deposit, where prospecting was revived for a short period during the year. Ores of COPPER have been found in many localities in Nova Scotia proper and Cape Breton, which are fully designated in Prof. How's "Mineralogy of Nova Scotia." In 1873 search was again made in the vicinity of Polson's Lake, but without striking the lode. Mr. Henry Poole, F.G.S., father of the Inspector of Mines, and for many years manager for the General Mining Association, when on a special survey of the Western gold fields, in 1862, for the Provincial Government, drew attention to several localities where he thought that prospecting for copper might be successfully conducted, but the prevailing apathy of the provincials has so far prevented anyone taking advantage of the circumstance. It is not improbable that before long tin mining will be added to the paying industries of the Province, tinstone having been found by the late Mr. Barnes at Tangier, by Mr. Ross at Country Harbour, by Mr. Campbell at Shelburne, and by the writer in Lunenburg county. And, lastly, as to QUARRIES, it is mentioned that large deposits of granite, slate, freestone, marble, and gypsum exist throughout the Province, but they are only worked on a very limited scale, and chiefly by Americans. The value of the gypsum, freestone, and grindstones exported in 1873 was respectively 24,000*l.*, 7000*l.*, and 5000*l.*

But it is without question the GOLD DEPOSITS which promise to contribute most largely to the Nova Scotian mineral wealth. The existence of gold in the Province as Mr. Heatherington once explained in a communication to the *Mining Journal*, appears to have been known to its earliest settlers, judging from the ancient names of "Cap d'*or*," "Bras d'*or*," Jeddore (evidently a corruption of "jeu d'*or*," or "jet d'*or*"), and *Gold* River, in all of which localities the metal has been found. In Dr. How's "Mineralogy of Nova Scotia" it is stated that gold was found 100 years ago, and gold washing was practised in the River Avon, at Windsor, about the beginning of the present century. The same authority also writes that the late Canon Gray, D.D., Rector of Trinity Church, St. John's, New Brunswick, who died in 1868, aged 70, told him that as a boy he had taken gold out of the rocks on his father's property, near Halifax, and had it smelted by a jeweller in that town; and that Mr. B. G. Gray, barrister-at-law, and son of the deceased clergyman, possesses old documents which show that particular importance was attached to certain parts of the family estate, presumably from the known existence of gold. Its occurrence, also, in Sherbrooke, Isaac's Harbour, and Lawrencetown is stated to have been familiar to the oldest residents. In general aspect, and in the succession of the beds, Mr. Selwyn considers that the whole series in Nova Scotia closely resembles the Cambrian and Lingula-flag series of North Wales in confirmation of which view he refers to having detected in the grey sandy and flaggy pyritous slates at the Ovens Bluffs, in Lunenburg county, specimens of the genus Eophyton, regarded by Mr. Billings, the palæontologist of the Geographical Survey of Canada, as characteristic of the Primordial Silurian epoch. Mr. Selwyn is also of the opinion that "all the deposits of auriferous quartz in Canada have been formed since the deposition and consolidation of the rocks with which they are now associated." The gold-bearing quartz of Nova Scotia is mostly undistinguishable in colour, structure, general appearance, or associated minerals—which are chiefly galena, blende, arsenical, copper, and magnetic pyrites—from the quartz of other gold regions, except, perhaps, that it is richer in visible gold. One species of dark-gray, laminated, exceptionally rich quartz, occurring only in veins of 6 in. and under, does appear to be peculiar to the Province, and it has not yet been matched from any other country.

To afford facility for estimating the probable profits to be derived from Nova Scotian gold mining, it may be mentioned that 5*s.* per day will secure good miners, that 2000*l.* suffices to erect a mill, and that the item of general expenses, including stores, hauling, superintendence, repairs to machinery, &c., should be covered by an average of $2 per ton. The production of the several proclaimed districts from the quartz mines alone, continuing developments on lodes now actually worked, within present lateral bounds, to a depth of 1000 ft., according to the average of declared yield, would exceed 25,000,000*l.* Quartz is the chief source of gold in the Province, and the proportion per ton varies considerably in each district. There are not only patches in every district, but there are

entire districts where the quartz is exceptionally rich; but, to counterbalance this, the veins are narrow, and more expensive to beneficiate: $7 per ton is at present the lowest cost of raising and reducing 2000 lbs. of quartz from a lode 1 ft. in width running in slate. The attention of quartz miners here has been too much confine to narrow lodes, but when it comes to be understood that it is relatively cheaper to operate on large quantities of low-grade ore than on picked lots of rich ore, wide veins yielding 5 to 10 dwts., which (as in Australia) might be profitably worked on an extensive scale at a cost of only 2 to 3 dwts., will cease to be disregarded. Small veins, however, will not be wholly abandoned so long as it known that in Grass Valley, California, $14,000,000 worth of gold have been produced from a lode which only averages 1 ft. in width. With the exception of beach washings at the Ovens, which were prosecuted during the years 1861 and 1862, alluvial mining has been almost wholly neglected. At Tangier Harbour a nugget weighing 27 ozs. was found in 1862; and at Middle River, Cape Breton, and Gay's River pieces of gold, weighing from 10 grs. to 17 dwts., have been washed. At Nine-Mile River, Stewiacke, Indian Path, and Gold River the alluvions are deep, and impregnated with fine gold. From the last-mentioned district Dr. How obtained very remarkable results, which are cited in his "Mineralogy of Nova Scotia," and in Dr. Dawson's "Acadian Geology," and were, to a great extent, practically sustained by Mr. Michel's subsequent experiments on the ground. Recent trials on an extended scale at Gay's River have given satisfactory returns; and although little known in Europe, the gold mines of Nova Scotia have been continuously worked on a small scale since the autumn of 1860, and from that period to the close of the year 1873 have yielded bullion of the approximate value of 911,000*l.*, in the following proportions:—

District.	Value, at £4 sterling per oz.	Quartz crushed. Tons of 2000 lbs.	No. of miners as for one day.	Average per 2240 lbs.	Maximum per 2240 lbs	Average per man per annum.
	£.			oz. dt. gr.	oz. dt. gr.	£. s. d.
Sherbrooke	252,041	78,853¼	438,698	0 17 21	22 8 0	179 5 0
Waverley	182,128	78,966	537,004	0 12 22	22 8 0	105 16 2
Renfrew	107,236	36,197½	262,418	0 16 14	19 10 23	127 9 10
Wine Harbour ...	89,965	31,571	197,678	0 15 23	97 8 19	141 19 10
Montagu	59,455	5,977	148,590	2 15 17	38 3 7	124 13 2
Oldham	56,419	15,641	188,162	1 0 5	116 3 8	93 11 0
Tangier	44,703	14,621¼	225,524	0 16 19	84 0 0	61 16 10
Isaac's Harbour..	41,042	10,834¼	141,180	1 1 4	9 11 6	90 14 0
Unlacke	32,433	12,299¼	79,248	0 14 18	20 3 5	127 13 8
Unclassified	12,078	5,825	79,482	0 6 12	27 5 2	47 8 4
Caribou	9,387	3,206½	23,036	0 16 9	25 15 5	127 2 10
Total, 1862-73	886,893	293,992½	2,321,020	0 16 18	116 3 8	119 4 4
" 1860-61	24,000	Averages not given, returns for this period not being sworn to.				
	910,893					

In explanation of why the Nova Scotian gold mines are so little known in Europe Mr. Heatherington remarks that it is—firstly, because the Local Government takes no pains to spread information regarding the mineral resources of the Province; secondly, because many of the mines are owned by citizens of the United States; thirdly, because the bullion is chiefly sent to the United States, and, therefore, rarely figures in the English Customs or Board of Trade Returns. The capacity of the mines does not depend upon one local discovery, nor upon the average of a few selected assays; but upon the crushing of about 300,000 tons of quartz, raised in various parts of the country, and from several distinct lodes. He adds that a very strong, but most unfair, prejudice exists in England against these mines, which is the more inexplicable as there have been only six companies formed in England for working them, and the failure of five thereof was attributable to mismanagement or want of foresight; for capital, experience, honesty, perseverance, and method are as essential to the success of gold mining as any other business. The assertion, frequently made, that the veins are too narrow to be followed with profit, is unfounded on fact, as nearly all the gold has been obtained from lodes of 1 ft. and under in width, and some small holdings have returned three or fourfold the capital invested in them. There are many lodes, from 6 to 20 ft. wide, which could be profitably mined on an extensive scale, but are neglected by explorers, as they do not contain visible gold, like the rich narrow ones. In Grass Valley, California, lodes 12 in. wide are being worked with profit at a depth of 1600 ft. The yield is about 30 dwts., or 1½ oz., per ton, but wages are from three to six times higher there than in Nova Scotia. Notwithstanding the desultory manner in which gold mining has been conducted in Nova Scotia, the average per ton and per man is in excess of the same averages in California and Australia. The mean per ton of 2240 lbs. for Victoria, from 1866 to 1873, is under 11 dwts.; in Nova Scotia, from 1862 to 1873 inclusive, it is 16 dwts. and 18 grs. The average proportion per man in Victoria, for the years 1866 to 1873 inclusive, was 36s. 6d. a-week; in Nova Scotia, for 1862 to 1873 inclusive, 45s. 5d. per week.

An undue discouragement has prevailed in Nova Scotia, and elsewhere, from persons engaged in this industry ignoring the fact that the occurrence of gold, and of nearly all metals, in quartz veins is intermittent, both vertically and longitudinally, and thus, after passing through a rich streak, they lacked courage to pursue their researches, and closed the mine, when a little perseverance in the right direction would have taught them the regular variability of metalliferous deposits, and have well rewarded their labours. Not a single company has yet been established in the Province with a view to permanency, or with such a working capital as would permit the adoption of those appliances and intelligent aids which have contributed to the success of the Australian, Brazilian, and Californian quartz mines. As to future prospects, he remarks that an instructive lesson of what might be accomplished when gold mining in this Province shall be presented as a stable industry, and not as a purely speculative enterprise, may be learned from the past history of Sherbrooke, the district most systematically developed. Mr. Heatherington gives an estimate of what he considers a justifiable outlay, and puts it against the returns that have actually been obtained, and then shows that, had the purchase price been 60,000*l.* instead of 168,000*l.*, the sum of 225,000*l.*—based on a most liberal allowance for wages, general expenses, and contingencies—still leaves a balance of 37,000*l.* in favour of the mines on the sworn yield of 252,000*l.*, or a net return of 13·6 per cent. per annum for the twelve years during which they have been worked. Here, then, without taking into account the increased and cheaper output of ore, and the increased yield of gold which would have been consequent on the adoption of modern improvements at the mine and in the mill, but adhering to declared totals, there remains a margin which would have provided a fair price for the property, have paid back the capital originally invested with good interest, and left the bulk of the mineral reserves comparatively still intact.

MILLS STARTING.—On Monday next the Exchequer quartz mill and Monitor and North-Western Company's mill and furnace will start up. The Exchequer will run on a lot of the richest ore mined in the county. It is thought there is sufficient high-grade ore now at the mill to enable the manager to pay the company before working the low-grade ($30) ore. The Exchequer is daily improving, and it will now not be long before there will be a change for the better in business here. High-grade ore is also being taken from the upper tunnel of this mine. The Monitor and North-Western mill will run on silver glance ore. The McGlew furnace, just erected at this mill, will be started up under the personal supervision of Mr. McGlew, the patentee. With the starting up and successful working of these mills, let us hope that the dark clouds that have so long hovered over us will now be dissipated.—*Alpine Chronicle*, Aug. 1.

EXCHEQUER.—This mine is being slowly and prudently worked with a small force. The mill has been shut down several months on account of the breakage of machinery. New machinery is now on the way up from below. It is surmised that Mr. Chalmers will await the proof of the McGlew furnace before he takes any very decided action concerning his mines. It is pretty well known that a superior quality of ore is now being extracted from the Exchequer.—*Alpine Miner*, July 18.

HOLLOWAY'S PILLS AND OINTMENT.—Multitudes have congratulated themselves on their immunity from deranged stomachs, sick headaches, and insuperable listlessness, since they have occasionally resorted to this fine alterative medicine. Our comfort, happiness, and security depend on the knowledge that most diseases originate from apparently a trifling beginning, and that the large proportion of them spring from inattention to the state of the stomach. Professor Holloway has turned this knowledge to good account, by discovering medicines which cure, without exception, the attendants on disordered digestion. They rubbed in twice daily over the stomach, liver, and bowels; to them it penetrates, and, aided by the pills, immediately works such a revolution as establishes perfect digestion.

Meetings of Public Companies.

LITTLEDEAN WOODSIDE COAL COMPANY.

The quarterly general meeting of the shareholders was held on Wednesday, Aug. 20, at the Town Hall, Cinderford, near Newnham, Mr. EDWIN CRAWSHAY in the chair.

The SECRETARY read the notice convening the meeting, and submitted the accounts for the quarter, which were passed.

On the recommendation of the directors it was resolved to pay the usual quarterly dividend at the rate of 10 per cent. per annum.

The CHAIRMAN said that during the last quarter the directors have had to contend with unfavourable and unavoidable circumstances—the decline in the price of coal, the falling off in the local consumption owing to the state of the iron trade, and the communication with the Great Western Railway being unfinished, also general dulness in trade. They are now pleased to inform you the communication with the railway is completed, sales commenced, and the trade of the district reviving.

A vote of thanks to the Chairman terminated the proceedings.

EBERHARDT AND AURORA MINING COMPANY.

The annual general meeting of shareholders was held at the City Terminus Hotel, on Tuesday,—Mr. DU PASS in the chair.

Mr. A. CRITCHETT (the secretary) read the notice convening the meeting.

The report of the directors (which appeared in last week's Journal) was taken as read.

The CHAIRMAN said he proposed to make a very few remarks upon the present occasion, because the true interests of the company appeared to be—at least in the opinion of some—of quite secondary importance. All he had to say was that a copy of every report received from Capt. Drake had been forwarded to the shareholders. It was true those reports had not been as frequent as could have been wished, but Capt. Drake had informed the board that his time had been so much occupied that he had been unable to do more than he had done in that respect; and even now, after this meeting had been postponed as long as possible so as to obtain Capt. Drake's complete reports, they were only mailed on the 6th inst., owing to the heavy amount of work which had to be done. That was the sole reason of the delay in the issuing of the report and accounts. The board knew that the works had only been progressing for five months, and that a portion of the period embraced the time of the contract with the South Aurora Company; but such accounts as had been placed before them had been verified from the other side. The statement was not a very flourishing one, but at the same time it embraced a period when there was really but very little real work done at the mine; the later accounts were extremely much more hopeful and cheerful. The mill was running now upon ore of an average of something like $65 per ton—it had even exceeded that, for sometimes the average had been $70 per ton for a week, so that, under any circumstances, it might be taken that the results were tolerably good and satisfactory at the present moment. A circular had been issued to the shareholders by Mr. Applegarth, in which certain charges had been made against the board of directors. This circular begins by stating that:—

"Knowing that our property is one of great value, being the former owner of the mines, and being a large shareholder, I feel the greatest interest in seeing the company yet made a great success, as I feel sure it can, and will be, if we can succeed in retaining the right man in the right place as manager. Judging from his telegrams to the board he is now making the property pay from 5000*l.* to 8000*l.* per month profit, and will in a very short time have paid all the debts, including the amount in which the late manager left the company involved out there, and the cost of rebuilding the mill, in all something like 20,000*l.* or 25,000*l.*, all of which he has been personally responsible for, and on his own credit carried out the affairs of the company when the directors failed to furnish him with the funds after instructing him to rebuild the mill. Such a man is invaluable to us, and we must get a board that will help him as far as possible, and not deceive him, and thereby destroy all confidence."

All he (the Chairman) had to say to that statement was that Captain Drake had been responsible for a considerable sum of money, but that it had ever amounted to the large sum stated he had very great doubts; but Mr. Applegarth says that "the directors had failed to supply Capt. Drake with funds." The shareholders would recollect that when he (the Chairman) last had the honour of addressing them he beseeched them to take up the whole of the debentures, for the purpose of finding the money to build this mill. So far Capt. Drake was right, if it were Capt. Drake addressing the shareholders through Mr. Applegarth. Only 4000*l.* or 5000*l.* was subscribed, but whether that was the fault of the directors or not he would leave it to the shareholders to say. Every arrangement had been made to send out more, and every shilling was sent out in advance; therefore, when Mr. Applegart says "they must get a board that will help Captain Drake as far as possible, and not deceive him, and thereby destroy all confidence," all he (the Chairman) could say in reply was that there had been but one desire on the part of the board, to co-operate with Capt. Drake in every possible way. Mr. Applegarth goes on to say that—

"It is unnecessary for me to say much about the great dissatisfaction that is generally felt amongst all the shareholders that I have seen of late, at not getting any reports of what our property is doing; and then, again, the accounts up to December 31 have been all ready to send out for the last six weeks, yet they keep them from us. This I think unpardonable."

As he (the Chairman) had already stated in his opening remarks, there never had been received a telegram or a report from Captain Drake that had not been printed and circulated among the shareholders. Immediately upon the receipt of a telegram a copy was forwarded to each of the daily newspaper, and appeared the following morning, and in no single instance had one been withheld. The accounts now submitted were made up only to Dec. 31, 1873, and their accountants had them for a considerable period, and would have been issued very much earlier had not the directors been waiting for the report from Capt. Drake to enable them to compile their own report. They had waited till the very last moment, but the report had not yet arrived. That was their explanation why this document, which was ready some time since, had not been forwarded to the shareholders, which Mr. Applegarth considered unpardonable. The circular then proceeds to state that—

"It is evident there is a want of harmony between the managing director, Capt. Drake, and the board here, which should not be allowed to continue. I fear the board have not kept faith with him, and, in consequence, he is paying all attention to managing the property and making it pay, and not keeping the board informed as he would if he felt that they were alive to the interests of the company, and that he could rely on their co-operation."

That (said the Chairman) was a charge without the slighest particle of truth in it. It would certainly be a very grave and serious feature were it true; but, so far as the directors knew, there was not a particle of truth in that statement. In order to justify the board he would, although very reluctantly, avail himself of a letter received from Capt. Drake by a member of the board, and written in July, within a week or ten days of the latest period that any communication could have been received. He would not trouble the shareholders, unless they wished, with the whole of the letter, but simply read the following extracts:—

[He then read extracts from the letter to the effect that he had the most friendly feeling towards all his brother directors, he believed them to be honourable and true men, and had done all in their power to help him; but he felt very much aggrieved at the shareholders in not forwarding him the amount promised him for the mill. Had he not implicit faith in the mine he should be bound to give his brother directors the information.]

That said (the Chairman) was the answer the directors had to make in reply to this charge of Mr. Applegarth. If, under these circumstances, any action were taken by the shareholders the responsibility must rest with themselves. The directors had done their utmost to promote the true interests of the company—they had incurred personal liabilities, and at this moment its affairs were brightening and looking better than for some time past, and it did seem hard that they should be called together to hear the opposing opinions of others, whereby the interests and welfare of the company were prejudiced. (Hear, hear.) He would say no more than that the accounts be received and adopted.——Mr. BAXTER seconded the proposition.

Mr. APPLEGARTH said he had issued the circular to which the Chairman had referred, in which he had asked for proxies to support him in securing the election at this meeting of a board of the best men that could be selected to carry on the business of this company. The Chairman had read a letter from Capt. Drake, but had omitted to read a letter or letters from Capt. Drake which drew forth that reply. He (Mr. Applegarth) had written to Capt. Drake some two months since asking him if he should go upon the board or not. The reply was "that it could do no harm, and as long as he had the management he should like him to be on the board very much, because he should then have one friend at least." He (Mr. Applegarth) was the vendor of the property, and he thought he knew its value; he had the utmost confidence in it, and his only object was to get a board that would work in harmony with Capt. Drake, and then he would remain to work it, but if there was to be discord he was satisfied he would not remain. Capt. Drake did not occupy that position for the sake of the salary that he received, but to prove the value of the property, in which he had the greatest confidence. The unsatisfactory results hitherto realised were the result of bad management. He was not going to express any opinion relative to the pamphlet which Mr. Phillpotts had addressed to the shareholders—that would be answered in another way. They knew to their cost the result of Mr. Phillpott's management pretty well. His only object, as he had already said, was to secure a good board to manage this company.

Mr. T. G. TAYLOR asked if it was worth while to lay before shareholders accounts that were eight months old? The South Aurora Company had furnished the result derived from crushing the Eberhardt ore, and had paid a dividend from it seven months since. He imagined the accounts might be made up to within a month, and there was no reason why they should not have the accounts submitted at the half-yearly meeting, which had been promised over and over again. He knew there had been difficulties to contend with, and also the dissappointments which Capt. Drake had had to experience, as well from bad weather as from want of funds, but he thought the board ought to be able to tell them what was the present financial position of the company. It seemed there had been a want of harmony.

Mr. BAXTER: Where?——Mr. TAYLOR: Mr. Baxter should not ask him that question, for when he mentioned to him some time since that he thought Mr. Applegarth's great mining experience would, if he were a member of the board, be of considerable assistance to the Chairman, who was a man of great commercial experience and skill, he told Mr. Baxter that some of the directors had retired because the Chairman sat upon them. He (Mr. Baxter) said that if the Chairman had treated him as he had other directors he should have resigned. There was hostility between the Chairman and Mr. Applegarth, but he asked the shareholders to elect Mr. Applegarth instead of Mr. Du Pass.

Mr. CHAMBERS suggested that the meeting should be adjourned.

Mr. STEWART wished to have some particulars of the item of 1427*l.* for legal expenses.——Mr. TOWN asked if the 400 (10 per cent.) debentures were raised for the purpose of erecting the mill?

Mr. BAXTER said as some remarks had been made with reference to what he had stated concerning Mr. Applegarth, he disclaimed the impression which Mr. Taylor wished to convey that there had been anything like dissension at the board. Some of the directors had made propositions that could not be entertained, and all he stated was that he should not like the Chairman to say to him what he had said to others. He did object to the interpretation that Mr. Taylor had put upon his remarks. When charges are made against the directors of not assisting Capt. Drake when the circumstances are known they should be repudiated by the shareholders. The directors had been personally liable for 1400*l.* each, and were now liable for 820*l.* each, and had given the whole of their services to the company without one single farthing of remuneration. He did think it a very ungracious thing under these circumstances that the directors were charged with not supporting Capt. Drake. Mr. Applegarth had challenged them about the letter, which brought forth the reply that had been read by the Chairman. He (Mr. Baxter) did write to Capt. Drake, telling him the shareholders complained they did not get information, and the letter contained Capt. Drake's reply.

The CHAIRMAN said that the item of legal expenses referred to by a hon. proprietor comprised the account sent from Nevada. The vouchers were placed in the hands of the auditors, who acted as their accountants, who certified to what they believed to be correct. When the late manager left they were involved in two or three lawsuits, which were not inexpensive operations. He then proceeded to read a financial statement, showing the amount subscribed and expended since he accepted the chairmanship in 1871. The total amount received had been 55,139*l.*, while the chief items of expenditure had been a remittance to Mr. Phillpotts of 13,000*l.*; 7600*l.* paid for machinery purchased by Mr. Phillpotts; 16,275*l.* in settlement of the vendor's claim; 8000*l.* remitted to Capt. Drake, and 6500*l.* for portion of loan; 4500*l.* for sundry expenses in London office for three years, including fees to the old directors, the present board never having received a farthing. Deducting other smaller items, left a small balance, which now stood to the credit of the company. No one knew better than Mr. Taylor that the only accounts which the board had received were those made up to December, and now submitted. Mr. Taylor also knew quite well that the board were not in a position to place the vouchers before the auditors earlier, simply because they had not come to hand. The board were as helpless as children, and could not submit accounts to proprietors unless they were placed in the directors' hands. Nothing took place in the Eberhardt office that was not known in the streets of London in five minutes after. If he had been successful in other companies it was owing in no small degree to the fact that his policy was that there should be no secrets known to the board that were kept from the shareholders. The item referred to by the hon. proprietor were debts left by the late manager, for which vouchers had been forwarded by Captain Drake, having been paid by him. The only irregularity was that they should have been brought forward in the previous half-year's accounts. (Hear, hear.) However, there was no doubt the goods had been supplied. Mr. Applegarth had made some remarks upon general matters connected with the concern, and all he (the Chairman) had to ask the shareholders was whether they considered Mr. Applegarth's circular was a fair one to issue to them? (No, no.) After all the unremunerated exertions made by the directors was it fair to place such a statement before 1200 shareholders? The only thing the directors had the time to do was to send a postscript simply to say the statements made by Mr. Applegarth were not correct. He did not say there was not a particle of truth in them: but the inference that was wished to be drawn was that there was some misunderstanding between the board and Capt. Drake, and that they were not working so cordially as could be wished, which had induced the letter from Capt. Drake, sent in reply to one forwarded by Mr. Baxter. If Mr. Applegarth was desirous of coming upon the board there was a proper and English way of doing it, and that was to come before the shareholders in an open and candid spirit, which always resulted in a fair and impartial verdict. (Hear, hear.) One of the reasons why he fairly thought it was not expedient Mr. Applegarth should not be upon the board was that Mr Applegarth represented Capt. Drake, who had a large interest as the vendors of the mines; but when there was a difference with respect to the management, and his opinion had been considerably shaken about the property being properly managed, it had occurred to him that they required some mining talent upon the board. It happened that he had some conversation with Capt. Drake, and they spontaneously came to the conclusion it would be very desirable to have Capt. Drake upon the board, and he invited him to a seat. Capt. Drake was Mr. Applegarth's partner, but it was for the shareholders to decide what they should do with respect to the direction. As to the adjournment of the meeting, he had, unfortunately, been disappointed in not being in a position to have submitted the accounts and full reports, as he had hoped to have had the pleasure of placing them before the shareholders, but whoever happened to be upon the direction would no doubt submit an open statement. He had hoped to have had that pleasure, and it rested entirely with the shareholders whether he should have that pleasure or not.

In reply to a question, the CHAIRMAN explained that 8000*l.* had been sent out to Capt. Drake, in part to pay for the mill, but 4000*l.* was remitted before the mill was built, and was employed in paying off pressing liabilities. The remaining 4000*l.* was only one-half what the directors had promised, but that was not the directors' fault.

Mr. BLATCH wished to know if the directors knew what profit had been made in June, July, and August?

The CHAIRMAN said no: the directors had not got them. In reply to a telegram which they had sent out they had just received the following reply:—"More work than anticipated. Impossible to give profit account." The inference was that they were making a very considerable profit, as Captain Drake had been able to pay off large liabilities. The board had been indulgent to Captain Drake, because they knew he had met with many disappointments.

Mr. STEWART moved, as an amendment, that the meeting be adjourned.

Mr. APPLEGARTH asked the Chairman to point out which part of his statement contained a falsehood?

The CHAIRMAN said the words he used were that it was not fair.

Mr. APPLEGARTH maintained the statements in the circular were true, and, therefore, it was fair. As to the adjournment of this meeting, it looked as if they were "making two bites at a cherry," for when the accounts were received they could be forwarded to each shareholder with the full report, together with anything that may be added by the directors. The only true policy was to complete the business of the meeting and elect a board. Adjournment was an old "dodge," when directors were afraid of not being elected.

Mr. STEWART did not see how the interests of the company could be damaged by an adjournment. Shareholders were greatly indebted to the present members of the board, who had given their services gratuitously, and had done everything possible to carry on this company under the greatest difficulty, and if more money were wanted he would subscribe his proportion, so as to pay off the liabilities and put the company in a sound financial position.

Mr. ENDEAN said that had, no doubt, to thank Mr. Applegarth for preventing the debentures having been taken up. He was pleased to find that Mr. Applegarth was desirous to protect the interests of the shareholders as well as his own, but he cautioned every shareholder against electing him to a seat at the board. Always avoid allowing a vendor of the property from sitting on a board; if they did so they would ever have an enemy in the camp to work out his own particular view for his own particular benefit. Mr. Applegarth had an objection to an adjournment, because he fears the shareholders whose proxies he holds will withdraw them in the interim.

Mr APPLEGARTH said he gave at the time his reasons why the debentures should not be subscribed for, and he should continue the same advice as long as the present Chairman held his position.

A SHAREHOLDER said it appeared to him that this adjournment had been moved for one purpose.

The CHAIRMAN said that he had only heard of the adjourment since he came into the room. He (the Chairman) was incapable of any under-handed action—he acted openly and above-board in all his operations. (Hear, hear.) Mr. Applegarth had lodged proxies representing 5000 shares, or little more than one-fifth of the total number of shares in the company. These proxies had not been obtained in that fair spirit that one Englishman should adopt to another. He thought the meeting was pretty conclusive upon that point. The board, in appointing Capt. Drake, thought they had conceded everything that Mr. Applegarth could desire in the nursing of his bantling. He thought the gentlemen who had moved the adjournment of the meeting had done the company a really good service. He was told the Chairman had directed the board, but it should be recollected that Mr. Baxter came upon the board at the solicitation of Mr. Applegarth, while Mr. Hamilton, another director, and his brother held a stake in the company which had cost more than that held by any other shareholder. Mr. Peerless retired from the board when he left this country for America, and the last words Mr. Peerless said to him (the Chairman) were that "he apologised for everything he had said." As to the two other directors—Messrs. Allen and Wyon—the former left the board because his time would not permit him to serve, and Mr. Allen had paid him (the Chairman) the greatest compliments; and Mr. Wyon left the board for his own personal reasons, because he was totally different in opinion with him (the Chairman) financially. Mr. Wyon was of opinion that any additional capital that might be required should not be raised outside the company. They had not elected other gentlemen to fill those vacancies, but left them open, to be filled by the shareholders. That was the policy the directors had pursued, and the proceedings of this meeting ought to be made known far and wide. He (the Chairman) held about seven times the stake in the company that was held by Mr. Applegarth. These were the strong reasons why he should wish this meeting to be adjourned. It was now his duty to put it to the meeting.

There were 48 hands held up in its favour and 5 against it, upon which the meeting was adjourned for three weeks.

Mr. Applegarth demanded a poll upon the question of adjournment, representing as he did 178 absent shareholders; but Mr. Kimber (the solicitor) ruled that it was not competent to demand a poll upon the question of adjournment.

A vote of thanks was then passed to the Chairman and directors.

The Chairman thanked the shareholders for this renewed mark of confidence, and added that it rested entirely with the shareholders as to who they should have upon the board. He was willing to leave it at any time they thought proper, but when he did leave he wished to hand back his trust into the bosom of shareholders, relieving him of his responsibility. (Hear, hear.)—The meeting then adjourned.

VAN CONSOLS LEAD AND BARYTES MINING COMPANY.

An ordinary general meeting of shareholders was held at the mine, near Llanidloes, on Friday last. The shareholders having thoroughly inspected the extensive workings of the mine, both underground and at surface, re-assembled at the account-house, when, on the motion of Mr. Wm. Gundry, seconded by Mr. Walworth, Mr. Matthew Greene was voted to the chair. The notice convening the meeting having been read,

The Chairman said: Gentlemen, we have all been through the mine, some of you have been underground, while others have examined the surface. You have seen for yourselves, and I cannot, therefore, do better at this stage than to read you the manager's report, as follows:—

I beg to hand you report of the operations of this mine since your last meeting, together with a statement in explanation of its present state and prospects. The main engine-shaft has been sunk 10 fms. 3 ft. for a 25 fm. level; this has been firmly timbered the whole depth, ground cut, bearers and cistern placed, and a 7 in. lift fixed therein. A cross-cut at the 25 has been driven 9 fms. 2 ft. 9 in. to the lode, and a level extended on the north wall of it 3 fms. 3 ft., which consists of lime, spar, blende, and lead ore; the lode is very promising, and cannot fail to open out valuable reserves on being extended under the productive ground wrought in the level above. A new winze has just been commenced under the 15 fm. level, 30 fms. in advance of the 25 fm. level end, but has not yet reached bearing part of lode. About 30 fms. east of this winze we sunk 5 fms. in the lode and found ore, but we were obliged to abandon this point in consequence of water. This will, however, soon be drained by the 25. No. 2 winze (122 fms. east of main shaft) is sunk to the depth of the 25. We are now driving east from the bottom of this winze on north part of lode, which is composed of carbonate and sulphate baryta, with good stones of lead ore. No. 3 winze, and the lode for a considerable distance, is drained by this winze, the lode being very wide and porous, as this level is now getting clear of the baryta, and lead ore making its appearance, I am daily expecting to come into the continuation of the rich course of ore we have at the No. 3 winze further east. No. 3 winze is 9 fms. deep, and in a splendid course of lead, and I believe it is connected with immense quantities of ore just below. As near as I can judge, this winze and a little ground stoped from the ends thereof have produced 140 tons of lead, which fixes beyond question the great productive power of this lode. The 15 fm. level has been extended 46 fms. 9 in. About 10 fms. of this drivage is in lead ore (under which the last-named winze has been sunk), and several fathoms yielded carbonate of baryta, averaging 2½ tons per fathom. The deep adit level has been driven 32 fms. 5 ft.: for 2 fms. in length it yielded good stones of lead. A cross-cut has been driven north (35 fms. behind the end) 6 fms. 3 ft., which passed through a branch of carbonate of barytes and lead ore. The 15 has yet to be driven under this ground. The 25, east of Little's shaft, has been extended 30 fms. 5 ft. Judging from the character of the lode, as well as the ground passed through, it is evidently too shallow for any permanent formation of ore; the drivage has, therefore, been suspended. In addition to the workings enumerated, a great deal has been done in the upper part of the mine in sinking winzes, stoping, &c., but the ground east and west of these winzes has not yielded the quantity calculated on.—Western Mine: The 30 has been driven 33 fms. 4 ft., making the distance from shaft 145 fms. The drought for the past few months has interfered with the drivage of this level, there being an insufficiency of water for the wheel. We are near the junction of the north and main lode; in fact, our last working was on the north lode, but we have not yet seen the lodes at their point of conjunction. We have about 30 fms. of ground between this level and the 15 west of main shaft. The drivage can be resumed, as we have now plenty of water for the pumping machinery. The dressing plant, &c., is very extensive and complete, the great expense of which is now at an end. The barytes ground in the back of the 15 yields on an average 2½ tons of carbonate per fathom. We have now upwards of 120 tons at surface and 600 tons of sulphate of the best quality, and I believe the ground we have opened will produce very large quantities. Since the last general meeting we have taken out foundations, and built a large engine-house, boiler-house, stack, &c., and erected a horizontal engine therein, which is worked with two of Galloway's patent boilers, built house for drawing machine, and sundry other work. This is an auxiliary power in case the wheel should be stopped by frost or drought. In conclusion, it affords me much pleasure to be able to state that the lode in the bottom workings has undergone a wonderful change for the better; indeed, it may now be said that the rich lode in No. 3 winze under the 15 (the deepest point of development) guarantees that we have secure hold of a very great deposit of lead, and that Van Consols will realise all that has been said by me in its favour, as well as by the many other mining agents who have inspected and reported thereon.—James Roach.

The Chairman then read the general balance-sheet of the company from May 25, 1869, to June, 1874, audited by Messrs. Johnstone, Cooper, Wintle, and Co., showing a balance in favour of the mine of 2863*l.* 17s. 10½*d.* without including the value of the machinery and the reserves of ore.

Mr. Carr: Is there any objection to issuing a statement of accounts (say) 14 days before the meeting, so that the shareholders might know their financial position?—The Chairman: The statement of accounts is issued in conformity with the Articles of Association.——A Shareholder: I think it very desirable that we should have the statement of accounts before the meeting.——Mr. Carr: I think it very advisable that the shareholders should understand the financial position of the company before coming to the meeting. I am sure there is no object in keeping it back.——The Chairman: I quite agree with you. There is no object in keeping it back, but it has been the custom in mining to render the accounts on the day of meeting.——Mr. John Petrie: Mr. Chairman, with your permission, I will move that the directors do take into consideration the advisability of sending out a statement of accounts (say) seven or fourteen days before the meeting.——Mr. Carr: I beg to second that.——The Chairman: I prefer having it so; it will save a great deal of trouble. Our Articles of Association (say) within 14 days after the meeting.——Mr. Carr: Where you have a number of shareholders, many of them, perhaps, at a distance would like to know what was being done.

The Chairman: The change will involve the passing of a special resolution. I shall be very happy to put your proposition to the meeting. I have read the manager's report and balance-sheet, and I shall be happy to answer any question in respect to them.——Mr. Petrie's resolution was put to the meeting, and carried unanimously.

A Shareholder: I presume the statement of accounts read to us will be printed, and circulated amongst the shareholders after this meeting.——The Chairman: Certainly. Some of you, gentlemen, have been underground in this mine, and you are able to form your own opinions as to what you have seen. I remember Mr. William Gundry, after a visit to the mine, offering 20,000*l.* for 2000 shares, and he could not get them, even though the people he applied to had them at their disposal.

Mr. Adam Murray: A number of us have been down in the mine to-day to see where those 8 tons per fathom were, and we have satisfied ourselves that this quantity does exist. A dry winze has been sunk 9 fms. below the 60 fm. adit in a course of ore worth at least 8 tons per fathom, and becoming more valuable; the bottom of the winze is the richest portion. We have to-day seen the beginning of a very large course of lead of the same character as the contiguous Van Mine, and continuous with that celebrated mine, whose pumping machinery is evidently draining our lower winzes. A very interesting leader or vein of calamine and gossan, on the dark flookan of the lode, is perceptible in the lode being driven on from the engine-shaft, and is visible throughout these lower winzes, and may be the connecting link of a vast course of ore in depth. This deeper ore occurs in a matrix of grit or arenaceous rock under the termination of the carbonate and sulphides of barytes, which has just been proved again in the eastern drift from No. 2 winze towards the course of ore in No. 3 winze, where the high cap of barytes has suddenly ceased, and the dark arenaceous rock, spotted with lead, is opening out from under it, and is of the same character as the rich lode in the winze, from which it is about 12 fms. distant.

Mr. Grenfell: Within the last six weeks I have been down in the winze, which was then 8 fms. deep, and I estimated the lode worth from 7 to 8 tons per fathom. I was also below the barytes winze, which has since got below the shaft. It was then barytes, with a small portion of ore. Since then the barytes has given way to ore, and it appears that we are now on the top of a large quantity of ore. In my opinion we are connected with an interesting and profitable concern. The branch with gossan is a most striking omen, and to have it at the bottom of the engine-shaft indicates that we are certain of coming into rich ground. I am convinced the shareholders will have reason to feel satisfied with what has been done here.

Mr. Buckley: I am very glad that I have been down in the mine, and I have come to the surface with a very high opinion of it. I am of opinion that our property is a really good one, and our prospects very encouraging. I am quite pleased that I have had the advantage of being down with gentlemen who have been connected with this mine from the commencement, who hold large stakes in it, and who are competent authorities in mining matters. I believe that as the levels get lower the lodes will show great stability.

The Chairman: The course of ore is very rich. The lode in the upper workings was irregular in produce, and the Van Mine was the same. The indications which we have in this mine have never been known to fail. From the commencement of this company I have been a large shareholder, and I have not lost one iota of confidence in it, and I firmly believe that there a large body of ore underneath us. Quoting an expression that they use in Cornwall, we "have got the fish by the tail." So far as our weekly reports are concerned, I believe that our agent writes what he feels at the time. My impression is that monthly reports would be much more reliable. (Hear.) When shareholders see weekly reports they usually hasten to the office and worry one with questions, complaints, &c. If managers of other joint-stock undertakings were worried like we are in mines for reports, my opinion is that their business would be most undesirably interrupted. The reports are too frequent to be of value to the shareholders, and the time spent in writing them would be better employed by attending to the actual working of the mine.

Mr. John Petrie: I move that we have monthly reports in future.——Mr. Grenfell: I beg to second that.——Mr. Buckley: I think that resolution very wise. It will not give much play to stockjobbers. Really, the way they go on is like a game of shuttlecock. I think monthly reports would be more reliable.——Mr. John Petrie: Should there be a good discovery in the meantime we might be made acquainted with it.

The Chairman: Certainly. I have this much to tell you, that I have had a great deal of trouble about Van Consols. I believe in it, and I shall stick to it. We have a mile of the finest lead lode in the world. We know that another mine is draining us, for our lode is porous. Between myself and my friends I represent nearly 12,000 shares, and my friends have sent me their proxies, I having only the good of the mine at heart.——Mr. Carr: I understand that the last 3000 shares were issued for the purposes of sinking.——The Chairman: Yes.——Mr. James Petrie: Are all the shares taken up?——The Chairman: Thy are. With respect to the accounts, there has been no delay in sending them out. It was only last Monday they were returned from the auditors. Under the Articles of Association the accounts are required to be sent out within 14 days after the meeting. I do not differ from the resolution you have passed, but merely state this in explanation.

On the motion of the Chairman, seconded by Mr. Murray, the statement of accounts and agent's report were unanimously adopted, and ordered to be printed and circulated amongst the shareholders.——The resolution authorising monthly reports was then put to the meeting and carried unanimously.——Mr. Jas. Petrie: Is there any probability of the cost being reduced?—The Chairman: There is, inasmuch as the surface costs are over now. They have been very heavy. The next business before the meeting is the election of directors for the ensuing year.——Mr. Buckley: I beg to propose that Messrs. Thomas Gundry, F. Richardson, and Adam Murray be elected directors of this company.——Mr. John Petrie: Mr. Greene is our largest shareholder, and most deeply interested in the mine. I beg to propose that his name be added to the list of directors.——Mr. Buckley: By all means.——Mr. J. Hoyle (Rochdale) seconded the motion, and the four gentlemen named were unanimously elected.

Mr. James Petrie: Mr. Chairman, before this meeting separates I wish to make a few observations as to the manner in which you remunerate your agent. Capt. Roach is, I have no doubt, paid according to the general rule, but I think a person in his position, having a large amount of money passing through his hands, and a man on whom we can rely for the successful prosecution of the mines, should be remunerated differently. The present mode is not the way that persons in similar positions are treated in joint-stock companies in Lancashire. The whole thing is left to the manager, and I think his interest should be bound up with ours. In my opinion he should have some percentage of the profits made by the concern, something that would stimulate him to make good dividends, not that I have any doubt that he has the interests of the company at heart. I think this meeting should take what I suggest into consideration, and say what percentage they would allow him.

Mr. Grenfell: I think it would be a very stimulating thing if it were instituted in mines generally, but you may calculate on Capt. Roach's best exertions without it.

The Chairman: The under agent should also be remembered. He is a very important man. I would suggest that you give Capt. Roach 4 and the under agent 1 per cent. on the divided profits.——A resolution in accordance with this suggestion was unanimously agreed to.

On the motion of Mr. Sykes, seconded by Mr. Buckley, the Chairman was accorded a unanimous vote of thanks.

The Chairman: As far as the executive are concerned they are most anxious to make a success of this mine. This is our only motive. That there is a gulf of ore under us I feel convinced, and I believe our mine is going to be a great one. I do not know at this time of any mine in Great Britain presenting such prospects. Although we are only a few fathoms under the adit level, we have a lode that is certainly worth as much as has been reported by the manager. I should have said much more to-day, but when I find all who have been underground come to the surface and express their complete satisfaction I am pleasureably silent. I know there are very large shareholders here to-day who came to the meeting with a strong feeling of dissatisfaction, but who, after having thoroughly inspected the workings, both underground and at surface, are perfectly satisfied that the condition and prospects of the mine have not been overstated, and that the works have been carried out in a permanently substantial manner. I know of no mine than can be worked more economically than Van Consols. Abundance of water at surface to work all the machinery, and no underground water to interfere with the cheap and rapid development of the splendid lode you have seen to-day. Gentlemen, I do not hesitate to say that our mine is drained by the Van Mine, which is a point of as much importance to the Van Mine as our own. The richest portion of the Van Mine is that nearest to Van Consols. A porous lode is a great indication of a rich one, and I look upon this fact as one of the most encouraging that has presented itself; it evidently means an equally rich lode in both mines. I am much obliged to you, gentlemen, for your appreciation of my services.——The business of the meeting then terminated.

[The meeting was numerously and influentially attended, upwards of 12,000 shares being represented.]

GREAT WEST VAN LEAD MINING COMPANY.

An ordinary general meeting of shareholders was held at the mine, near Ponterwyd, Cardiganshire, on Thursday, Aug. 20,

Mr. William Gundry in the chair.

Mr. Matthew Greene (the secretary) read the notice convening the meeting, and the statement of accounts.

Capt. Roach read the agent's report, as follows:—

Since the last general meeting the underground engine-shaft has been sunk from the 34 to the 46 fm. level. This struck Greene's lode at the bottom of the shaft, which we have driven upon 6 fms., and found it well defined, and carrying blende and a little lead ore. Also drove a cross-cut north in this level some 6 fms., and at this point intersected the main lode, and have driven east on its course 6 fms., and found it to consist of veinstone, and a strong branch of blende and lead ore; this will, no doubt, improve directly. West of the cross-cut we have driven 15 fms.; some portion of it produced 1 ton of lead per fathom. Greene's lode has not yet been intersected in this level, but we think we are now at the junction, as a large stream of water flows from the forebreast. Consequently we believe we shall be into the course of ore gone under the level above in driving 6 ft. of ground more. The lode is very wide and very wet, and presents the same indications as it did in the 34 just before the ore was discovered. In the 34 east about 20 fms. have been driven, the last 10 fms. in a productive lode, the roof of which we are now stoping. The average produce is 1½ ton of lead per fathom. The 34, west of shaft, has been driven about 30 fms.; this has passed through ore in two sections, 20 fms. in length, which has yielded on an average 1 ton of lead per fathom and upwards, but in some places it has yielded as much as 3 tons per fathom. The stopes in the east end of this ground are now yielding 1 ton of ore per fathom each, but the bunch of ore last driven through is still standing. A winze has been sunk from the 34 to the 46, west of engine-shaft, and the roof of the 46 we are now stoping, where the yield of ore is 1½ ton per fm. Eliza's engine-shaft was been sunk 4 fms. 1 ft., or the depth of the 34 fm. level. Here we are driving a cross-cut to intersect north lode, which will be about 20 fms. in length; this lode has not been wrought in this part of the property, but yielded well in the old mine, which is 200 fathoms east, hence we may expect to meet with a course of ore here when it is intersected. The outcrop is all that can be desired. We advocate the sinking of Eliza's shaft to the 46 as soon as possible, and thence to intersect the main lode, which will be fully 100 fathoms west of the present 46 fm. level. In the shallow levels opposite this shaft the lode is very masterly, and consists of lime spar, manganese, gossan, and some very fine bunches of lead ore, therefore a vast improvement may be expected at the 46 fathom level. Twenty-two fathoms east of Eliza's shaft, at the 22 fathom level, a winze has been sunk on the course of the lode to the 34 fm. level; this contained ore throughout—average yield 25 cwts. of lead per fathom. This ground we are now stoping both east and west, and find the yield to correspond with that of the winze. In addition to the stopes already named, we have four more in different parts of the mine, which yield about 10 to 12 cwts. per fathom each. There is a large quantity of orestuff yet on the stulls, which in all probability will produce 150 to 200 tons of ore. From the present appearances of the mine we fully expect to be able to return 30 tons of lead ore monthly, and an addition to it from further improvements in the levels, particularly from the 46 west. We have 10 tons of lead at surface, which we shall daily add to. The machinery throughout the mine is in perfect order, and effective in every respect.—James Roach.

Capt. Roach having concluded the reading of his report, said if any shareholder present did not thoroughly understand it he would be happy to give such explanations as might be required.

Mr. Greene: I should like to see Great West Van make the returns it is undoubtedly capable of. Now, with ample means and most efficient machinery, you ought to return double the quantity of ore you have hitherto done. With the resources at your command you ought to return from 40 to 50 tons of ore per month.

Capt. Roach: We have been opening up the mine and doing a good deal of permanent work upon which there will be no expenditure in future. What we have done will facilitate our future operations and tend to materially increase our returns. Until lately the drought has been much against us in dressing.

The Chairman: Do you draw night and day?—Capt. Roach: We do.

Mr. Greene: With our resources we ought to return 50 tons per month. We have all this ore underground, and it should be brought to the surface with promptitude and energy.——The Chairman: The stuff is there, and ought to be brought to the surface.——Capt. Roach: As soon as we tap the 46 our returns will be largely increased.——The Chairman: The lead is there, and exertions must be made to bring it to surface. This mine ought to pay very well.

Mr. Greene: I cannot understand why we are not returning 20 per cent. dividend from such a property as this.——Capt. Roach: In about 6 ft. more we will get into the run of ore in the 46.——Mr. T. Gundry: When you cut though the lode in the junction will you meet Greene's lode?—Capt. Roach: Yes. I believe we shall be able to return more when that is through.——Mr. T. Gundry: Is it a porous lode?—Capt. Roach: It is.——The Chairman: Before you get to the 34 east how many fathoms shall you have to drive?—Capt. Roach: About 20 fms.——The Chairman: Are you going to drive a cross-cut at the 34?—Capt. Roach: We had better go to the 46.——Mr. Ward: How long will it take you to drive the 6 feet of ground you speak of?—Capt. Roach: Only a few days.——Mr. Ward: Have you the tramway all through the mine?—Capt. Roach: We have.——The Chairman: Is the appearance of the lode in the 46 equal to your expectations?—Capt. Roach: It is even better than I expected.——The Chairman: Is your idea of the north lode good?—Capt. Roach: It is a capital lode.

On the motion of the Chairman, seconded by Mr. Wilson, it was unanimously resolved that the agent's report and the statement of accounts be received, adopted, and circulated among the shareholders.

The Chairman: My brother and myself are the directors at present, and it is part of the business of the present meeting to elect directors.——A Shareholder proposed the election of Messrs. H. W. Lindow, F. Richardson, and A. Murray as directors. They were very useful members of other companies, and had no doubt would be of great service on the board. They held large stakes in the mine, and had its interest at heart.——Mr. Ward seconded the proposition, which was carried unanimously.——Messrs. Evans, Bouchard, and Co. were elected auditors for the ensuing year.

The Chairman: Gentlemen, we are in a position to-day to pay a dividend, and the question for your consideration is whether it would be wise to do so. If Capt. Roach can give us (say) at least 30 tons of ore per month there is no reason why we should not pay a dividend.——Mr. Greene: I think we ought to declare a dividend. The shareholders expect it from our earnings. However, you had better take the sense of the meeting on the question.——Mr. T. Gundry: We have done a great deal of dead work, and our earnings allow of a dividend.

It was then resolved that a dividend of 1*s.* per share be declared.

Mr. Eden: I beg to propose that the thanks of the meeting be given to our Chairman for presiding.——Mr. Wallworth: I beg to second that.——Carried unanimously.

The Chairman: Gentlemen, I am very much obliged to you for the vote you have just passed. For my part, I should like Capt. Roach to return us 60 tons of ore per month, and I am perfectly satisfied that we have a great mine here. During the last twelve months we have done a great deal of dead work, and there is no doubt that the north lode will show a great improvement in the mine. When we next meet I hope we shall have satisfied ourselves of that. I am sure Captain Roach will do all he can to return us 50 tons per month. He tells you that we have but 6 ft. more to drive to get into a good run of ore. In that case I do not see why we should not have 50 tons a month. I have no doubt we shall get good returns for our money, for I am confident the mine is a good one, and, in fact, a better piece of ore ground cannot be got anywhere. It is admirably situated in a fine country, and only requires energetic development to yield us profitable returns. I beg to thank you again for your kindness, and to express a hope that we shall meet next time under even more prosperous auspices. I think we should not separate without demonstrating our feelings with regard to distant shareholders. It is a matter for regret that they do no attend our meetings regularly in large numbers. They should not draw a line between themselves and the executive, who have a common interest with them. The worry and anxiety which the executives of mining companies in London have to go through is not properly appreciated, and, if you will allow me, I will propose a vote of thanks to the distant shareholders present at this meeting, and couple with that the names of Messrs. Petrie and Eden.——Mr. Ward seconded the proposition, which was agreed to.

Mr. James Petrie: Mr. Chairman and gentlemen, as you mentioned my name first I must be first to thank you. I am very glad to be present at this meeting, out of which I expect there will come much good. It is my first visit to this mine, and I am very pleased with what I have seen to-day. As a distant shareholder I shall be able to give a good account of it to anybody I meet who is interested in it.

The Chairman: I have no doubt that our manager and Capt. Bramwell have done their best for us, though we should like to have seen larger results. I beg to propose a vote of thanks to both of them for their exertions.

Mr. Ward: I beg to second that. I have known Capt. Roach for over twenty years, and I am quite sure he has the interest of the company at heart. So far as I can see the mine is a really good one, and contains large courses of ore. I have every faith in the manager.

Capt. Roach: Gentlemen, I am very much obliged to you for the compliment you have paid me. Since I have had the management of this mine I have used my best exertions, and I have taken every precaution to conduct operations on a permanent basis with economy. A great deal of dead work has been carried on through stiff ground, but that will not trouble us again. Up to this time we have not driven the 46 fm. level west sufficiently far to tap the water and allow us to go on the course of the ore under the 34. I believe that, having driven the 6 ft. mentioned in my report, we shall come on a rich course of ore.

THE BLINMAN (LATE YUDANAMUTANA) CONSOLIDATED COPPER MINING COMPANY.

An extraordinary general meeting of shareholders was held at the company's offices, Cannon-street, on Thursday,

Mr. C. Hill in the chair.

Mr. R. Lock (secretary) read the notice convening the meeting.

The Chairman said that the business was of a purely formal character, with the exception of the last paragraph of the notice, which had become necessary in consequence of Mr. Bingley having declined to act conjointly with Mr. Lock as one of the liquidators. Nothing had transpired since the last meeting that could affect the decision they had arrived at. There had been a meeting of debenture holders, and it was agreed by them that the property should be put up for sale by auction.

Mr. Attrell enquired whether they had had any further communication from the mine?——The Chairman said they had not.

A Shareholder stated that he represented Mr. Lefeaux, and wished to be permitted to inform the meeting that Mr. Lefeaux had ascertained that many of the bondholders were willing to accept 10*s.* in 1*l.*; and he desired to ask the bondholders present at the meeting whether they would be prepared to join in a scheme which would secure the payment of the 10*s.* in 1*l.* compromise to the bondholders, and the payment of the creditors in full?

The Chairman did not see how anything could be done until the date fixed for the sale. At present the instructions to the trustees were to sell at 22,500*l.* If that amount were not reached the debenture-holders would have to be again consulted.

Another Shareholder remarked that Mr. Lefeaux's idea was that a syndicate should be formed for taking over the property.

The resolutions "That the company be wound up voluntarily; that Mr. William Richard Bingley, of Lincoln's Inn-fields, and Robert Lock, of 66, Cannon-street, accountant, be appointed liquidators of the company; that the remuneration of 52*l.* 10*s.* be given to Mr. Robert Lock for his services as liquidator" were confirmed.

Mr. Attrell thought that as Mr. Bingley had declined to act as liquidator someone else should be appointed from amongst the outside shareholders, as many who never attended the meetings would be very dissatisfied that all the arrangements should be left to the secretary.

Upon the proposition of the Chairman, seconded by Mr. Martin, it was resolved that, inasmuch as Mr. Bingley had declined to act as liquidator, Mr. Peter Attrell, of Tredegar-square, Bow-road, be appointed liquidator in conjunction with Mr. Lock, and that 52*l.* 10*s.* be voted to him as remuneration.

The resolution was unanimously agreed to, and after the usual complimentary vote of thanks the meeting separated.

RUBY MINING COMPANY.

At a special meeting of shareholders, held on Wednesday, a letter was read from Sir George Bowyer, the Chairman of the company, tendering his resignation. The writer stated that, although not at all responsible for the difficulties of the company, he had showed his willingness to assist the shareholders by returning to the company a portion of the fees which had been properly paid to him. Had this concession on his part been met by the shareholders in a proper manner he should have been induced to retain his position as Chairman of the company; but as they had declined to support the board, he must also decline to be any longer officially connected with the company. At the the same time, he reserved to himself the right to be paid the balance of the fees dues to him, after giving credit for the sum of 250*l.* already paid. In a subsequent letter Sir George Bowyer tendered the resignation of Mr. Delapierre, which he was authorised by that gentlemen to do, and Mr. Hartmont, who was present, also resigned his seat. On the motion of Mr. Lewis, seconded by Mr. Malcolm, it was unanimously resolved "That the resignation of Sir George Bowyer, Mr. Delapierre, and Mr. Hartmont be accepted." With similar unanimity Mr. Malcolm, Mr. I. D. Smith, and Mr. William Russel Crowe were elected directors.

[For remainder of Meetings see to-day's Journal.]

THE VAN MINES—MONTHLY REPORT.

Aug. 25.—Seaham's engine-shaft is down 10 fms. 2 ft. below the 75. The 75 is extended west 17 fms. 1 ft.; the present end is worth for the part of lode carried 30*l.* per cubic fathom for lead ore. We have to-day resumed the driving of the 75 east. The cross-cut driven south from the 75 west has been communicated with the winze sunk below the 60, so that this level is now supplied with good ventilation. The 60, west of shaft, is extended 67 fms.; the present end driving upon the main leader of the lode is worth for lead ore 80*l.* per cubic fathom. The stripping down of the south part of the lode by four different sets of men at the several points in the sides of this level, west of shaft, as far as seen is worth 16*l.* per cubic fathom for lead ore. The two stopes in the back of this level, west of shaft, are worth on the average 23*l.* per cubic fathom; mean width of lode 3 fms. We shall resume the driving of the 60 east in course of a day or two. The stripping of the lode to full width in the side of this level at the present end is worth 28*l.* per cubic fathom for lead ore. I have set to two sets of men to stope in the back of this level, where the lode is on the average 15 ft. wide, and worth about 27*l.* per cubic fathom for lead ore. The 45, driving in the soft by side of the lode, has been communicated with the winze sunk below the 30, at a point 130 fms. west of shaft. To-day we have commenced crossing north to prove the value of the lode at the present end of the level; this part of the mine is well ventilated now that we have holed with the winze above mentioned. The winze sunk below the 45 fm. level cross-cut, for the purpose of transmitting stuff to fill up stopes in the back of the 60, is communicated with the said stopes. The stopes in the back of this level, 18 in number, are worth 29*l.* per cubic fathom; average width, 21 ft. The 30 is extended west of Seaham's shaft 176 fms.; 25 fms. more driving will bring us under Edward's shaft, when we hope to draw all the water down. In the present end we are having good stones of lead at times, but not regular, so that we cannot put any valuation upon it as yet. The four stopes in the back of this level, east and west of the shaft, are worth on the average 18*l.* per cubic fathom; mean width, 19 ft. The three stopes in back of the 15, east of shaft, are worth about 10*l.* per cubic fathom; average width, 18 ft. The permanent levels are pushed forward regularly.

Surface: We are getting on with the new dressing machine. Our machinery is all in good working order. We have now a good supply of water, and our reservoir is nearly full. The sale upon this month's produce will take place on Thursday next; quantities as usual, 450 tons of lead and 150 tons of blende ores.—Wm. Williams.

Valuable and Economic Lubricant.—The subjoined communication will be of interest to all users of machinery, since the importance of having a really good lubricating oil can scarcely be overestimated:—

Sir,—We see a paragraph in last week's Journal respecting a new oil for lubricating. We think you have rather gone beyond the limits of what is strictly correct in saying this oil is considerably cheaper than any other oil that approaches it in quality. We have, for seven years, been sole agents in this country for a real American natural lubricating oil, and we hold certificates from some of the leading houses in this country and the Continent, to the effect that it is as a lubricator equal to sperm oil, lard oil, or Galipoli oil, even for speeds of 3000 revolutions per minute, while there is a saving in price of nearly 40 per cent.; and, so far, nothing has been introduced that offers the same advantages of price and quality. We are prepared to appoint really efficient agents in all districts.

Liverpool, Aug. 24. Alex. Sparrow and Co.

Iron and Steel Institute.—The first number of this volume for the current year of the Journal of the Iron and Steel Institute (published through Messrs. E. and F. N. Spon, of Charing Cross) has just been issued, and contains, in addition to the verbatim report of the Annual General Meeting, held at the house of the Institution of Civil Engineers, Great George-street, Westminster, in May, the usual quarterly report of the progress of the iron manufacturing industries and matters connected with them at home and abroad.

London, Chatham, and Dover Railway.—Under the title of "The London, Chatham, and Dover Railway; its Position Analysed and its Prospects Reviewed," Mr. William Abbott, of the Stock Exchange, has just published (through Messrs. Bates, Hendy, and Co., Old Jewry) a pamphlet showing the favourable position of the company, and the amalgamation of the three southern lines—the London, Chatham, and Dover, the South-Eastern, and the London and Brighton. Mr. Abbott very clearly shows that only 200,000*l.* has to be raised for providing additional accommodation at many of the stations, and additional supply of engines and wagons, and that the increased receipts of the current half-year add to the stability of the undertaking.

Life Assurance Statistics.—A comprehensive tabular statement has been published, showing in consecutive order the year of establishment of 109 life assurance offices, the date to which the last published accounts have been made up, the income of each office, the savings in the year, and the funds in hand at the end of the year. The perusal of the figures by the uninitiated would not in all cases lead to correct conclusions as to the stability of the companies, many standing high, which are admittedly shaky and *vice versa*, but much interesting information may be obtained from the table. The statement gives evidence of much care and skill on the part of the compiler—Mr. T. J. Buse, of Swansea—and will, no doubt, have an extensive circulation.

VIENNA EXHIBITION, 1873.

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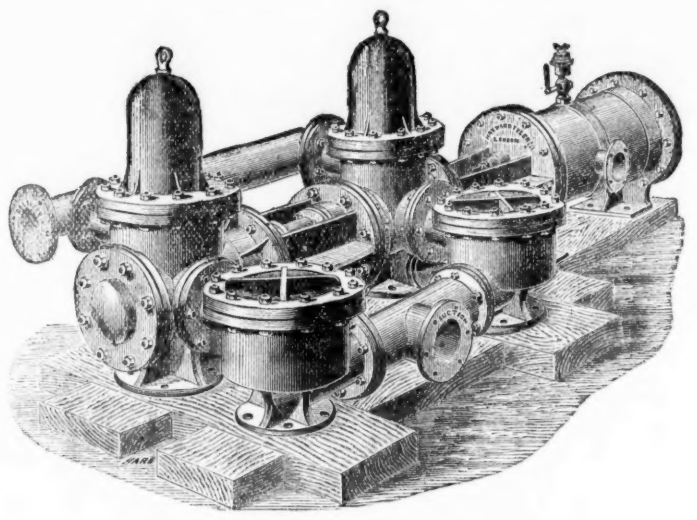

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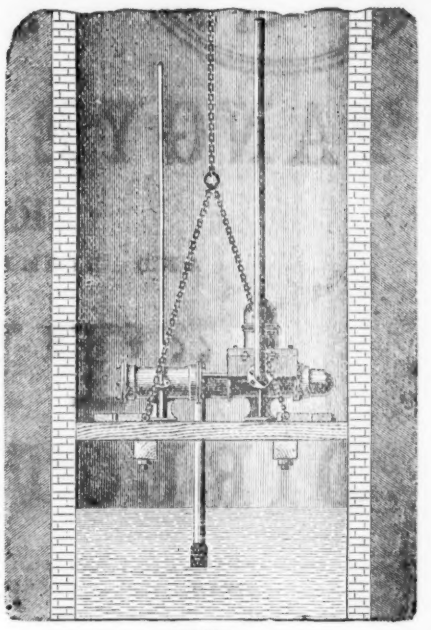

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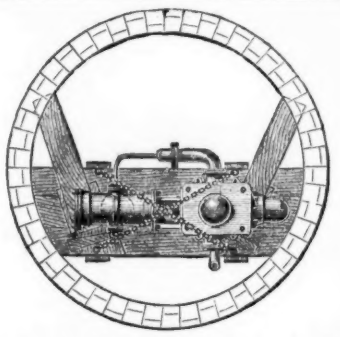

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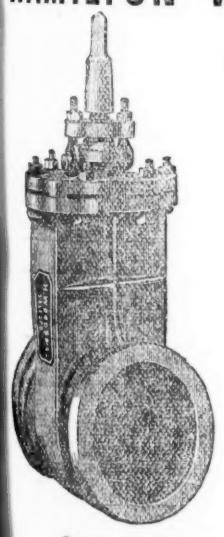

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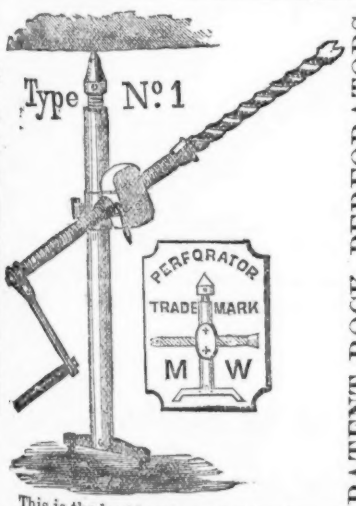

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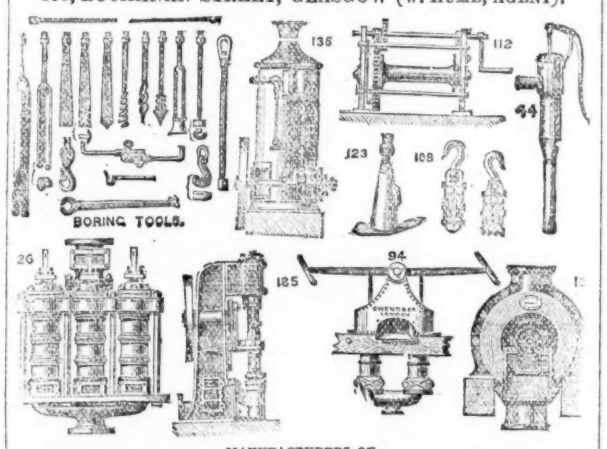

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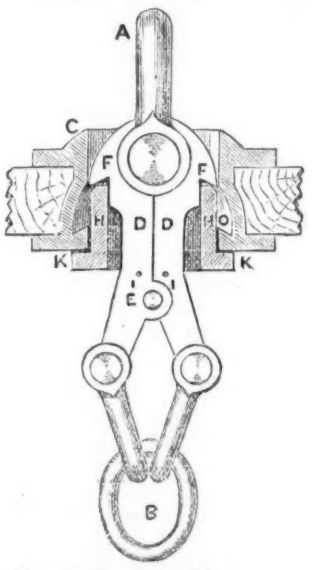

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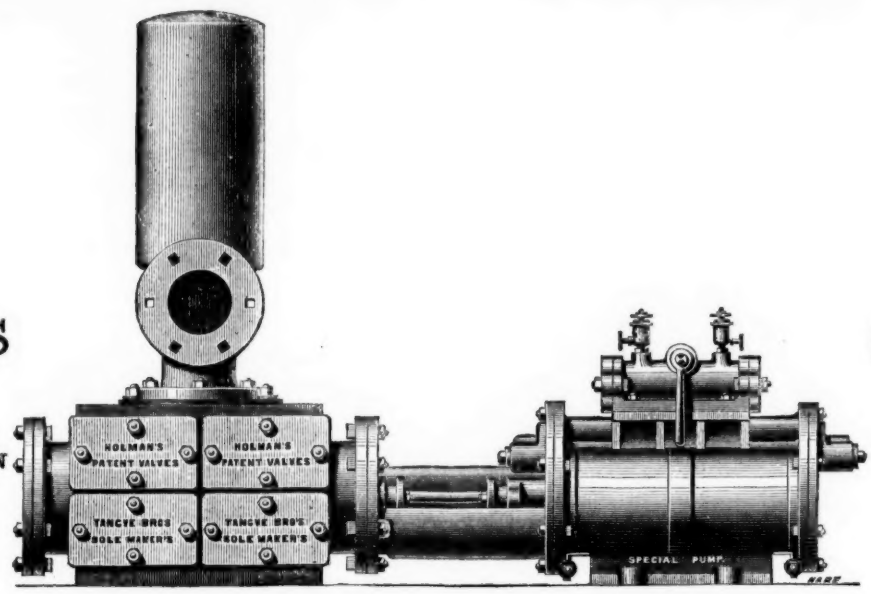

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Length of Stroke ....Inches	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Gallons per hour	680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070
Price ....£	**16**	**18**	**20**	**25**	**22 10**	**27 10**	**32 10**	**25**	**30**	**35**	**40**	**30**	**35**	**40**	**45**	**50**	**40**	**45**

CONTINUED.

Diameter of Steam Cylinder....Inches	8	8	8	9	9	9	9	9	10	10	10	10	10	10	12	12	12	12
Diameter of Water Cylinder....Inches	6	7	8	5	6	7	8	9	5	6	7	8	9	10	6	7	8	9
Length of Stroke....Inches	12	12	18	12	12	12	18	24	12	12	12	18	24	24	18	18	18	24
Gallons per hour....	7330	9750	13,000	5070	7330	9750	13,000	16,519	5070	7330	9750	13,000	16,519	20,000	7330	9750	13,000	16,519
Price ....£	**50**	**55**	**65**	**50**	**55**	**60**	**70**	**85**	**55**	**60**	**65**	**75**	**90**	**100**	**75**	**80**	**85**	**110**

CONTINUED.

Diameter of Steam Cylinder....Inches	12	12	14	14	14	14	14	14	16	16	16	16	16	18	18	18	18	
Diameter of Water Cylinder....Inches	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14	
Length of Stroke....Inches	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	
Gallons per hour....	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000	
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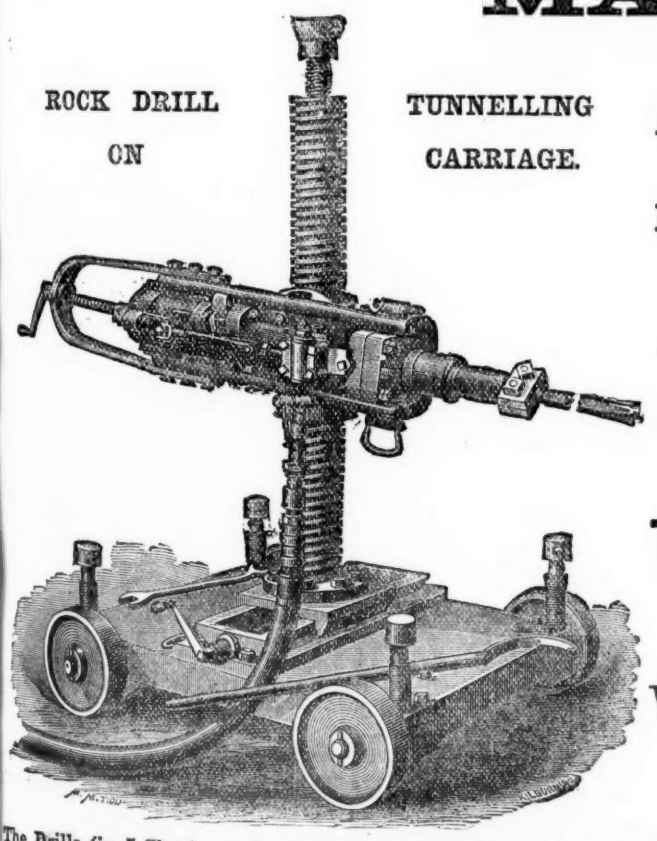

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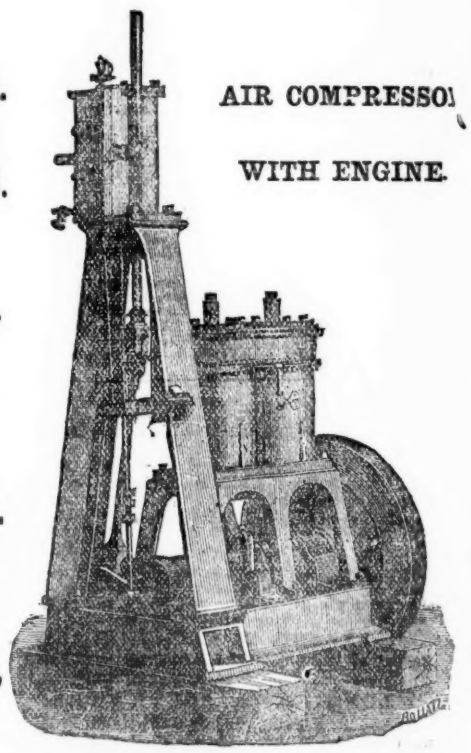

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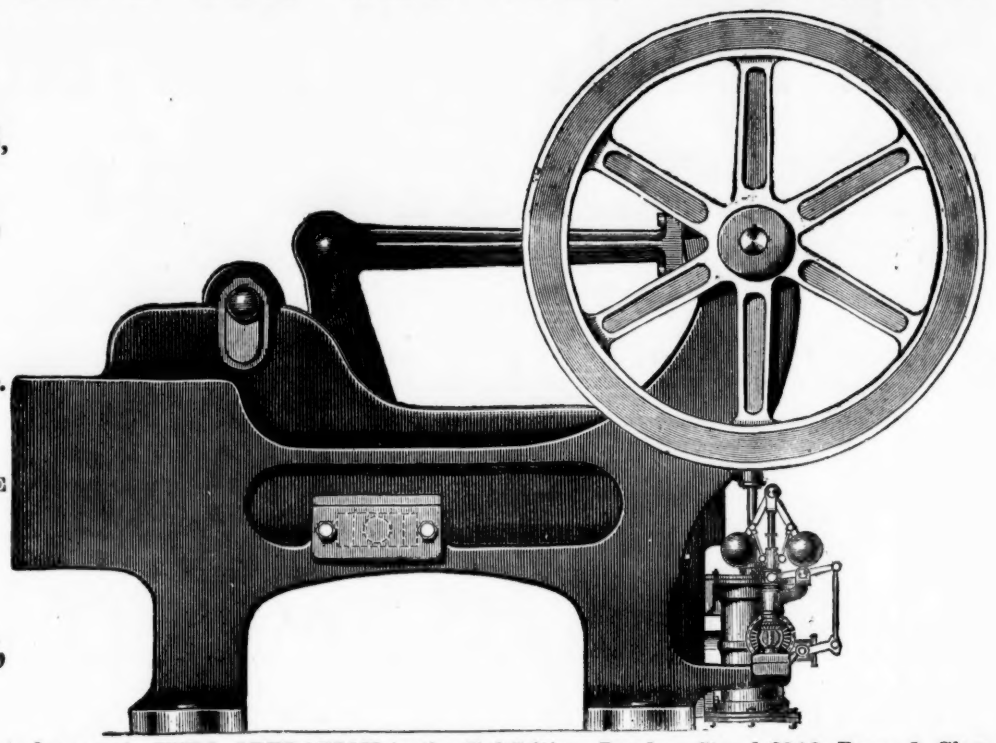

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